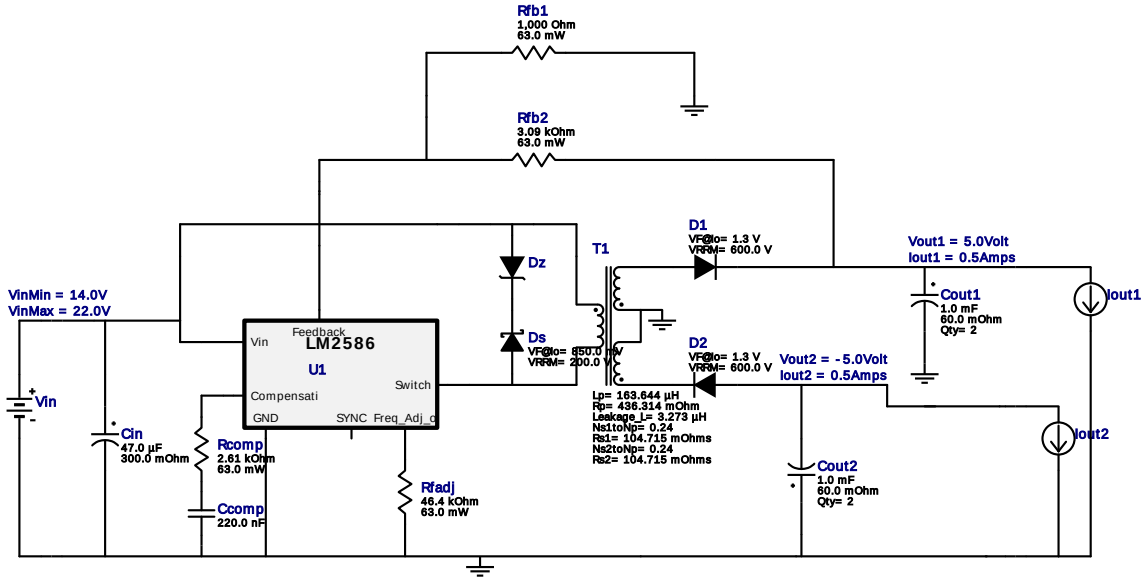
WEBENCH® Design Report

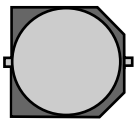
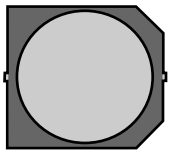
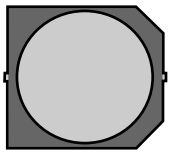
VinMin = 14.0V
VinMax = 22.0V
Vout = 5.0V
Iout = 0.5A

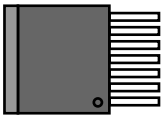
Device = LM2586S-ADJ/NOPB
Topology = Flyback
Created = 8/22/13 6:11:51 PM
BOM Cost = $0.00
Total Pd = 3.14W
Footprint = 1,615.0mm2
BOM Count = 16

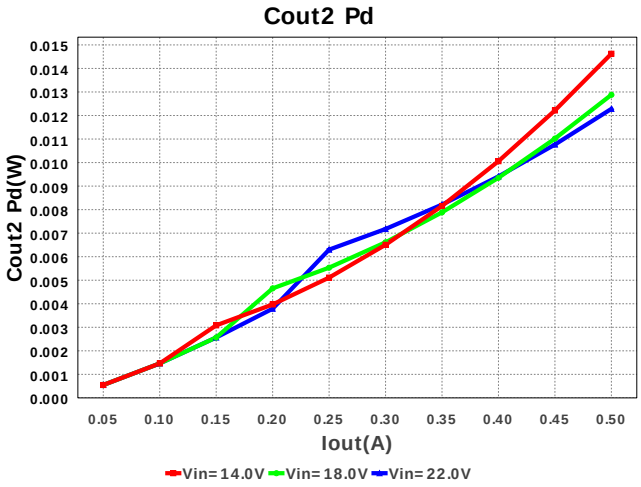
Design : 1228027/312 LM2586S-ADJ/NOPB
LM2586S-ADJ/NOPB 14.0V-22.0V to 5.0V @ 0.5A

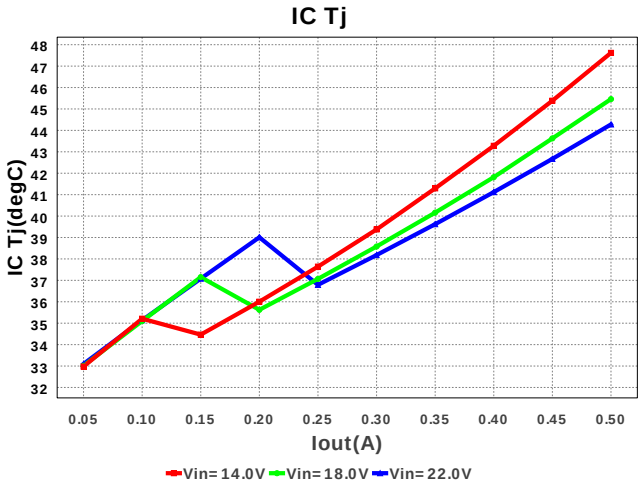


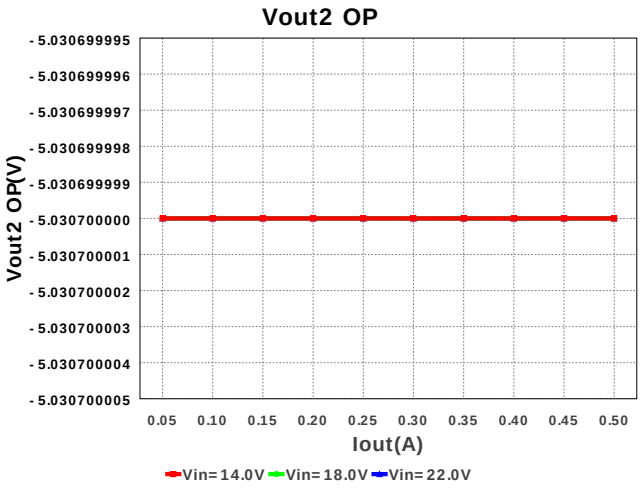
Electrical BOM

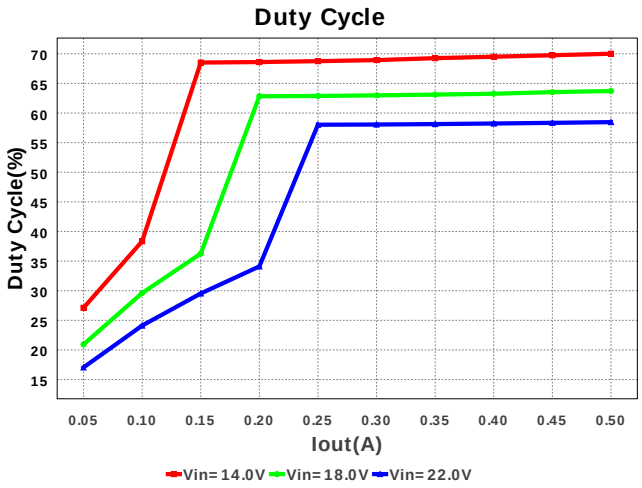
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Ccomp	MuRata	GRM155C80G224KE01D Series= 379	Cap= 220.0 nF VDC= 4.0 V IRMS= 0.0 A	1	$0.01	 0402 8mm2
2.	Cin	Panasonic	EEE-FC1H470P Series= FC	Cap= 47.0 µF ESR= 300.0 mOhm VDC= 50.0 V IRMS= 500.0 mA	1	$0.24	 SM_RADIAL_G 172mm2
3.	Cout1	Panasonic	EEV-FK1E102Q Series= FK	Cap= 1.0 mF ESR= 60.0 mOhm VDC= 25.0 V IRMS= 1.1 A	2	$0.48	 SM_RADIAL_H13 264mm2
4.	Cout2	Panasonic	EEV-FK1E102Q Series= FK	Cap= 1.0 mF ESR= 60.0 mOhm VDC= 25.0 V IRMS= 1.1 A	2	$0.48	 SM_RADIAL_H13 264mm2
5.	D1	Bourns	CD214B-F3600	VF@Io= 1.3 V VRRM= 600.0 V	1	NA	 SMB 44mm2
6.	D2	Bourns	CD214B-F3600	VF@Io= 1.3 V VRRM= 600.0 V	1	NA	 SMB 44mm2
7.	Ds	Diodes Inc.	DFLS1200-7	VF@Io= 850.0 mV VRRM= 200.0 V	1	$0.21	 PowerDI123 22mm2
8.	Dz	Micro Commercial Components	3SMAJ5937B-TP	Zener	1	$0.12	 SMA 37mm2

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
9.	Rcomp	Vishay-Dale	CRCW04022K61FKED Series= CRCW..e3	Res= 2.61 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	 0402 8mm2
10.	Rfadj	Vishay-Dale	CRCW040246K4FKED Series= CRCW..e3	Res= 46.4 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	 0402 8mm2
11.	Rfb1	Vishay-Dale	CRCW04021K00FKED Series= CRCW..e3	Res= 1,000 Ohm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	 0402 8mm2
12.	Rfb2	Vishay-Dale	CRCW04023K09FKED Series= CRCW..e3	Res= 3.09 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	 0402 8mm2
13.	T1	CUSTOM	CUSTOM	Lp= 163.644 µH Rp= 436.314 mOhm Leakage_L= 3.273 µH Ns1toNp= 0.24 Rs1= 104.715 mOhms Ns2toNp= 0.24 Rs2= 104.715 mOhms	1	NA	CUSTOM 0mm2
14.	U1	Texas Instruments	LM2586S-ADJ/NOPB	Switcher	1	$3.10	 TS7B 199mm2

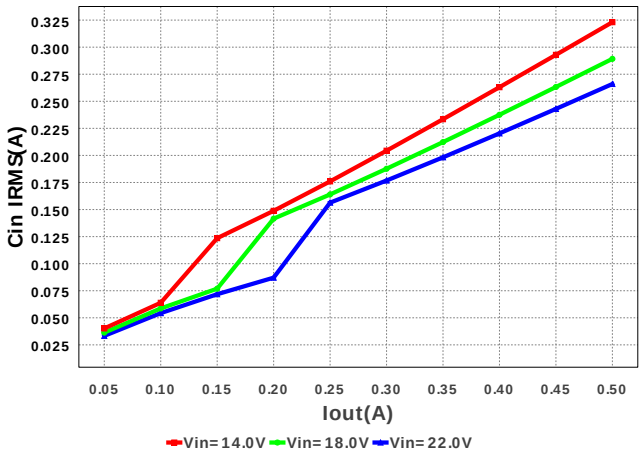




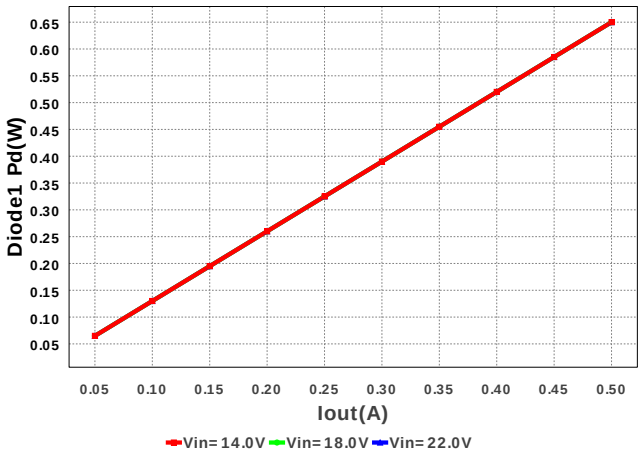




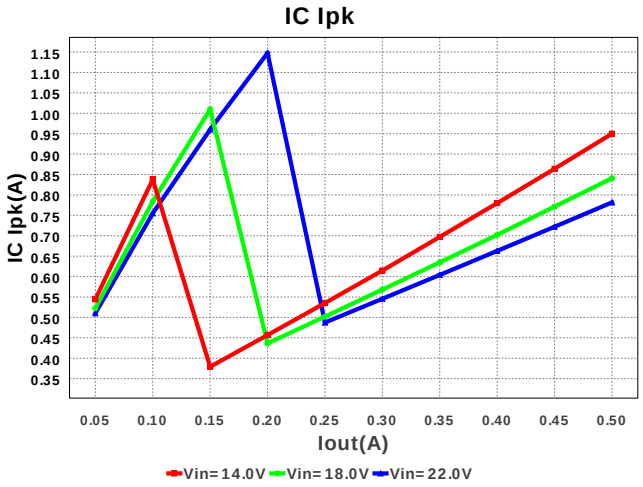
Cin IRMS



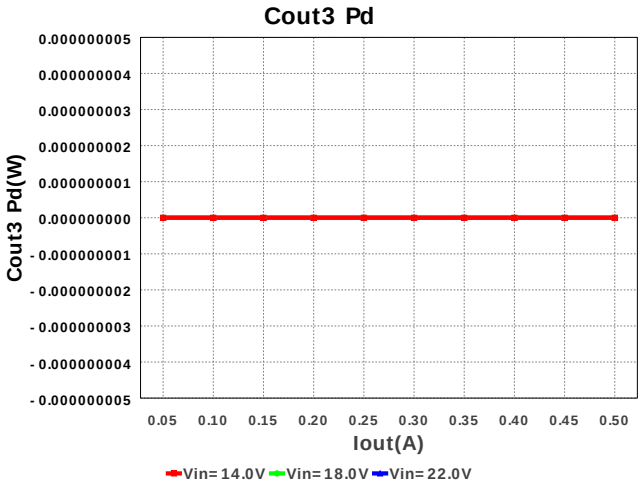
Diode1 Pd



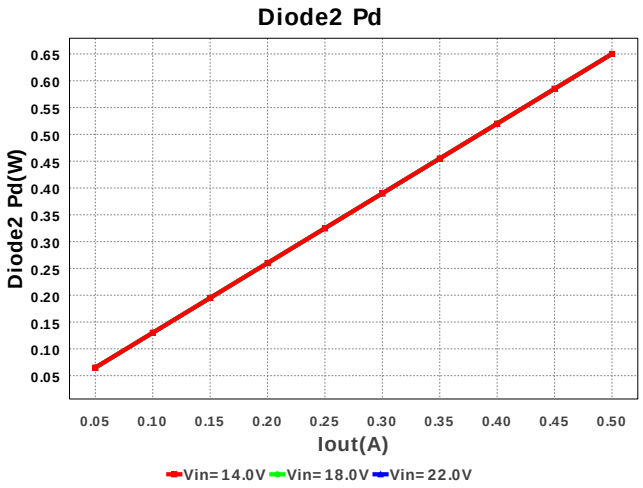
IC Ipk



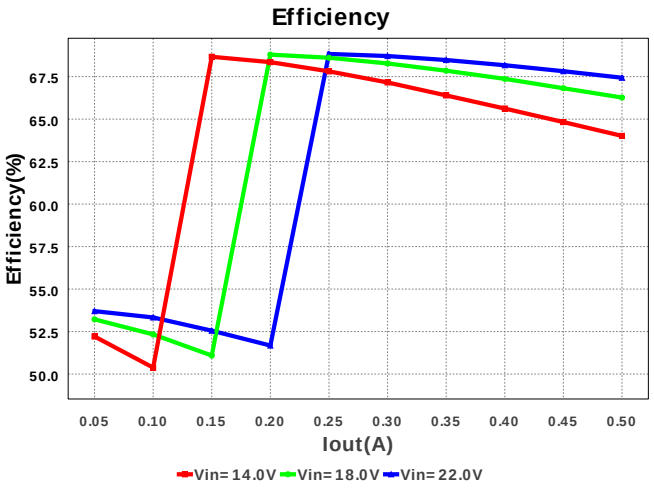
Cout3 Pd



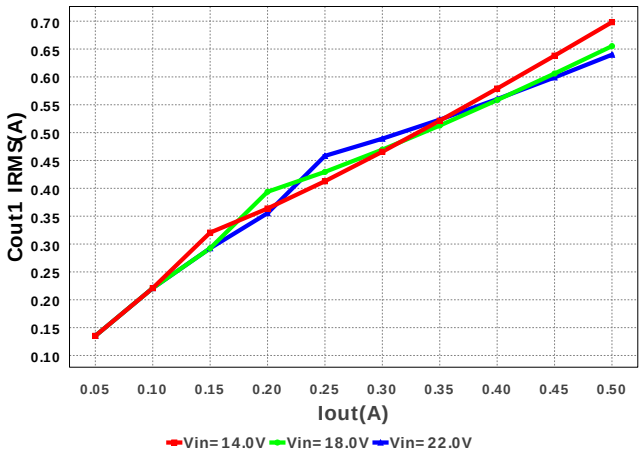
Diode2 Pd



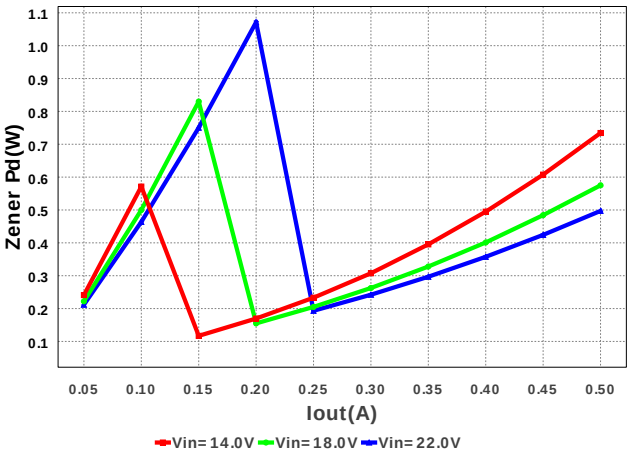
Efficiency



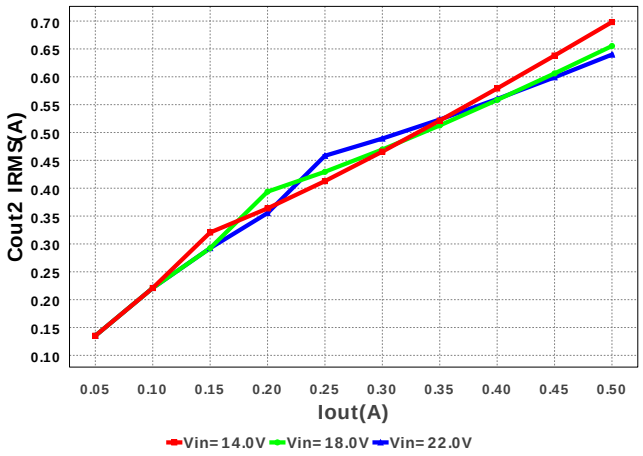
Cout1 IRMS



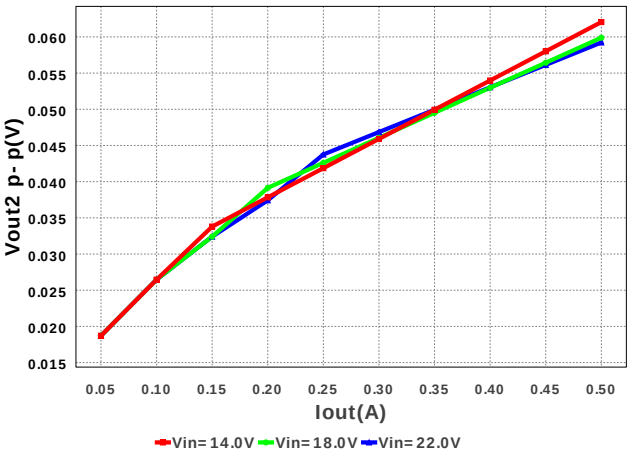
Zener Pd



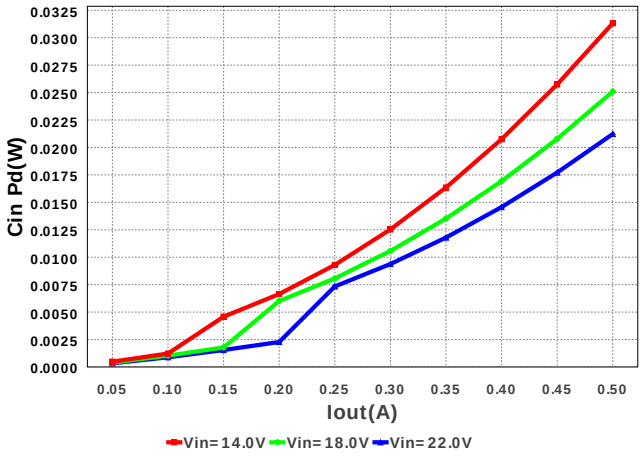
Cout2 IRMS



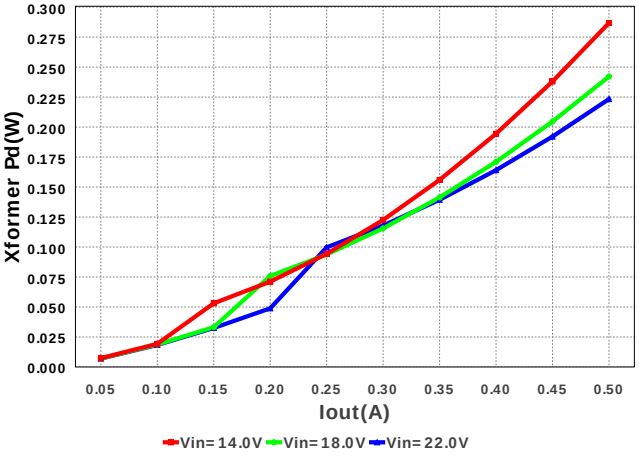
Vout2 p- p

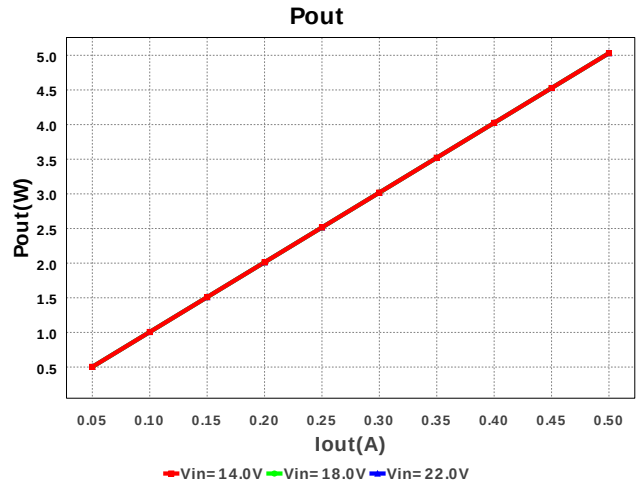


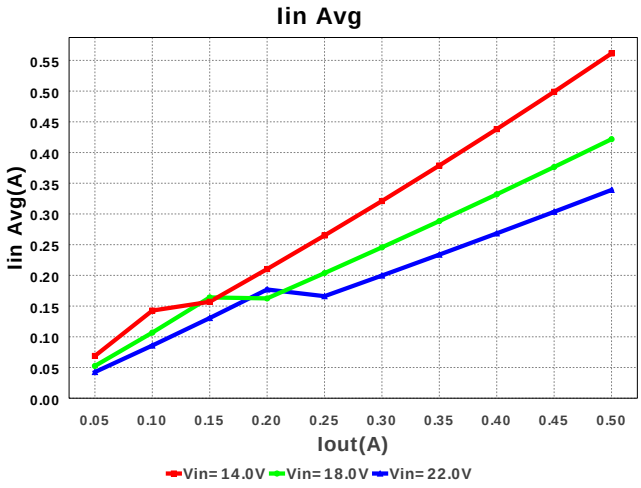
Cin Pd

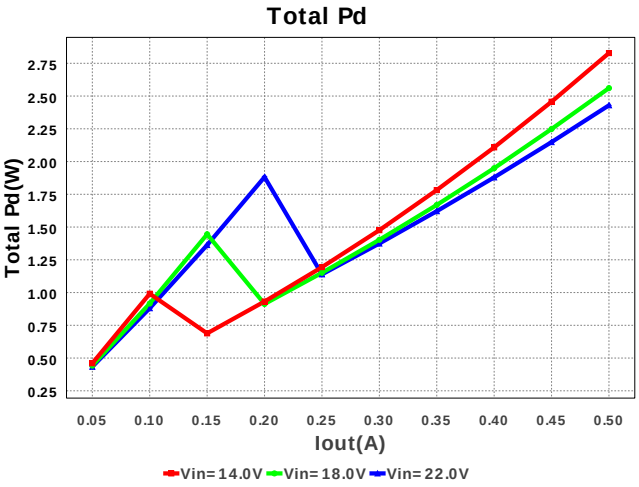


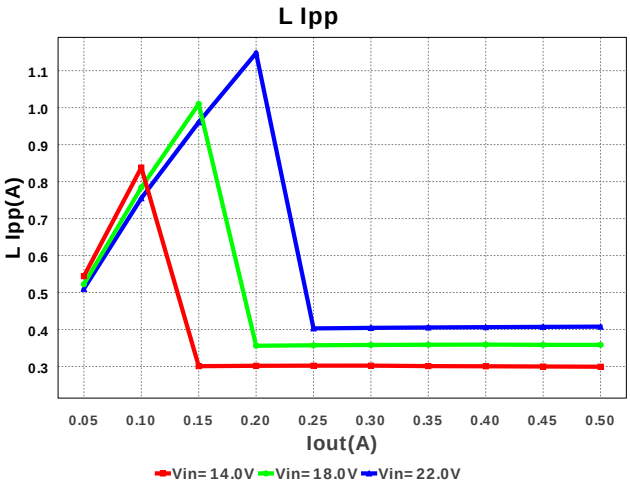
Xformer Pd

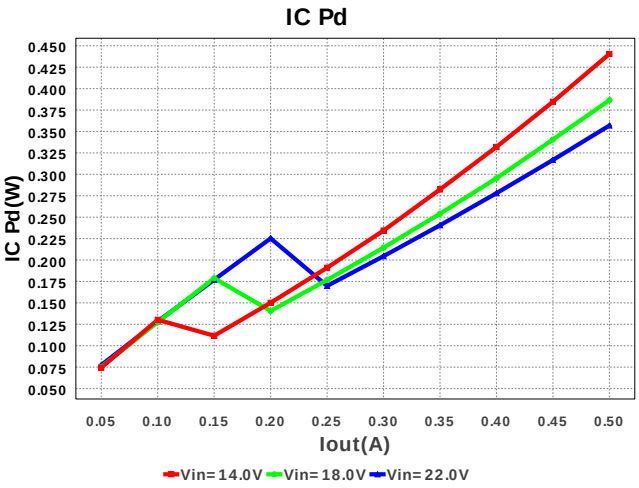


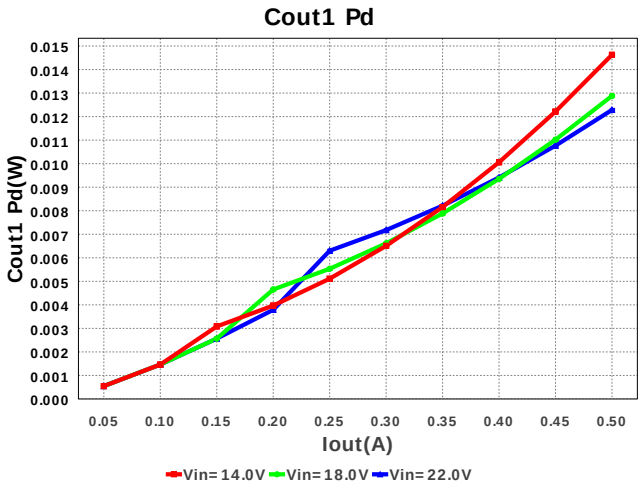


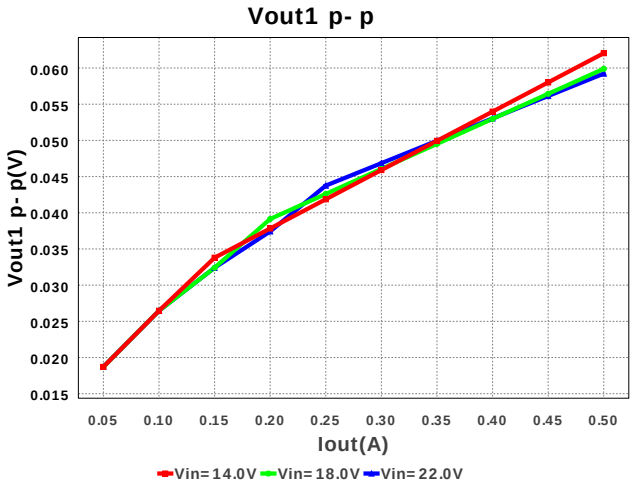












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	337.336 mA	Current	Input capacitor RMS ripple current
2.	Cout1 IRMS	724.915 mA	Current	Output capacitor1 RMS ripple current
3.	Cout2 IRMS	724.915 mA	Current	Output capacitor2 RMS ripple current
4.	IC Ipk	978.996 mA	Current	Peak switch current
5.	Iin Avg	583.65 mA	Current	Average input current
6.	L Ipp	314.506 mA	Current	Peak-to-peak inductor ripple current
7.	BOM Count	16	General	Total Design BOM count
8.	FootPrint	1.615 kmm2	General	Total Foot Print Area of BOM components
9.	Frequency	151.071 kHz	General	Switching frequency
10.	IC Tolerance	22.0 mV	General	IC Feedback Tolerance
11.	Mode	CCM	General	Conduction Mode
12.	Pout	5.031 W	General	Total output power
13.	Total BOM	$0.0	General	Total BOM Cost
14.	Vout1 OP	5.031 V	Op_Point	Operational Voltage 1
15.	Vout2 OP	-5.031 V	Op_Point	Operational Voltage 2
16.	Duty Cycle	70.794 %	Op_point	Duty cycle
17.	Efficiency	61.567 %	Op_point	Steady state efficiency
18.	IC Tj	48.479 degC	Op_point	IC junction temperature
19.	ICThetaJA	40.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
20.	IOUT_OP	500.0 mA	Op_point	Iout operating point
21.	VIN_OP	14.0 V	Op_point	Vin operating point
22.	Vout1 p-p	64.891 mV	Op_point	Peak-to-peak output1 ripple voltage
23.	Vout2 p-p	64.891 mV	Op_point	Peak-to-peak output2 ripple voltage
24.	Cin Pd	34.139 mW	Power	Input capacitor power dissipation
25.	Cout1 Pd	15.765 mW	Power	Output capacitor1 power dissipation
26.	Cout1 Pd	15.765 mW	Power	Output capacitor1 power dissipation
27.	Cout2 Pd	15.765 mW	Power	Output capacitor2 power dissipation
28.	Cout3 Pd	0.0 W	Power	Output capacitor3 power dissipation
29.	Diode1 Pd	650.0 mW	Power	Diode1 power dissipation
30.	Diode2 Pd	650.0 mW	Power	Diode2 power dissipation
31.	IC Pd	461.974 mW	Power	IC power dissipation
32.	Total Pd	3.14 W	Power	Total Power Dissipation
33.	Xformer Pd	313.412 mW	Power	Transformer power dissipation
34.	Zener Pd	993.276 mW	Power	Zener power dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	500.0 mA	Maximum Output Current
2.	Iout1	500.0 mAmps	Output Current #1
3.	Iout2	500.0 mAmps	Output Current #2
4.	VinMax	22.0 V	Maximum input voltage
5.	VinMin	14.0 V	Minimum input voltage
6.	Vout	5.0 V	Output Voltage
7.	Vout1	5.0 Volt	Output Voltage #1
8.	Vout2	-5.0 Volt	Output Voltage #2
9.	base_pn	LM2586	Base Product Number
10.	source	DC	Input Source Type
11.	Ta	30.0 degC	Ambient temperature

Design Assistance

1. **LM2586** Product Folder : http://www.ti.com/product/lm2586 : contains the data sheet and other resources.