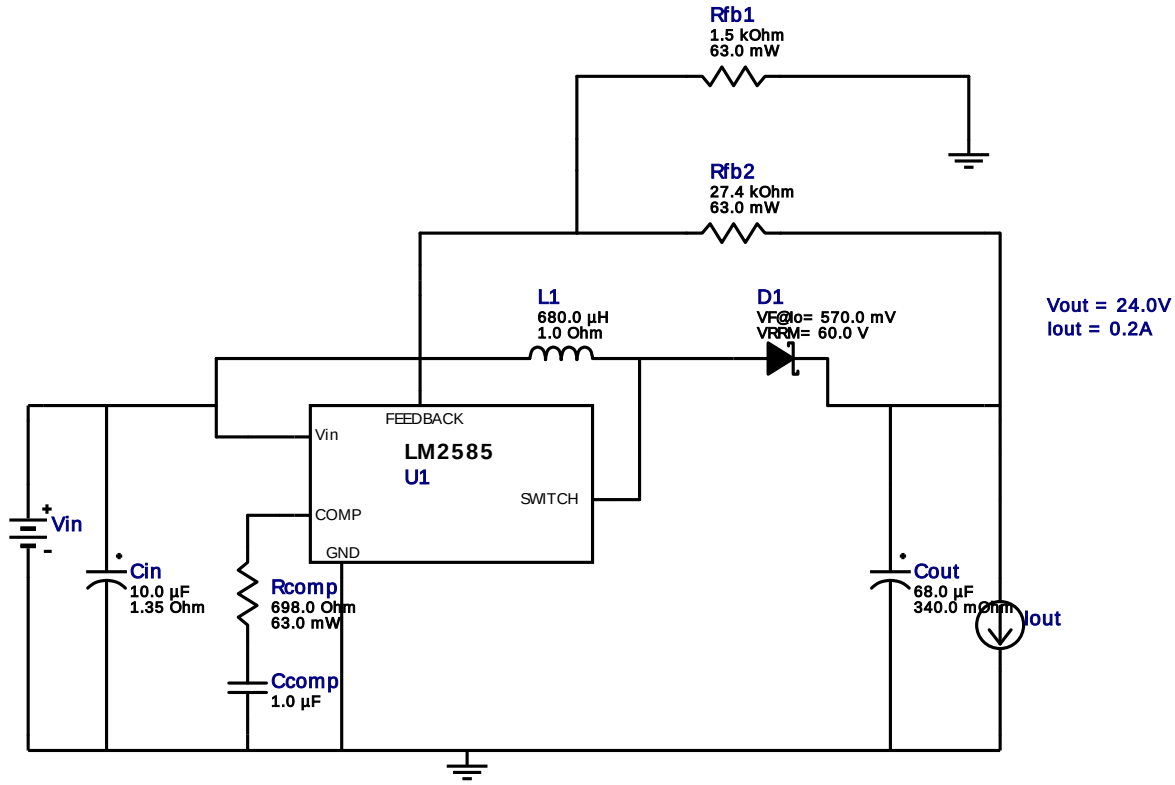
WEBENCH® Design Report

VinMin = 11.0V
VinMax = 13.0V
Vout = 24.0V
Iout = 0.2A

Device = LM2585S-ADJ/NOPB
Topology = Boost
Created = 7/15/16 8:37:46 PM
BOM Cost = $4.24
BOM Count = 9
Total Pd = 0.58W

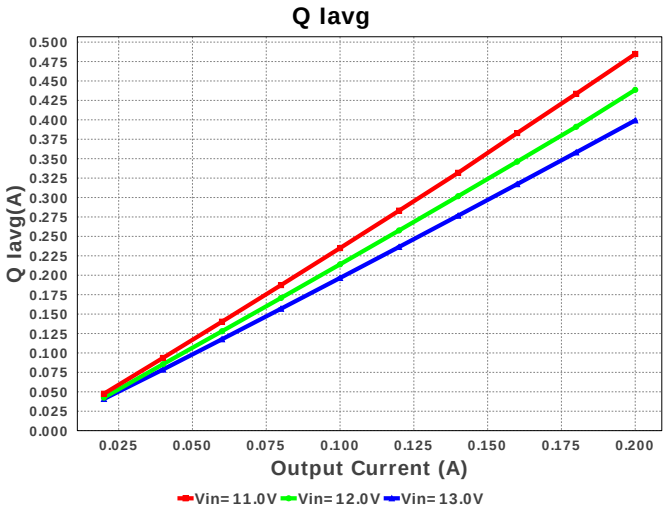
Design : 4742013/41 LM2585S-ADJ/NOPB
LM2585S-ADJ/NOPB 11.0V-13.0V to 24.00V @ 0.2A

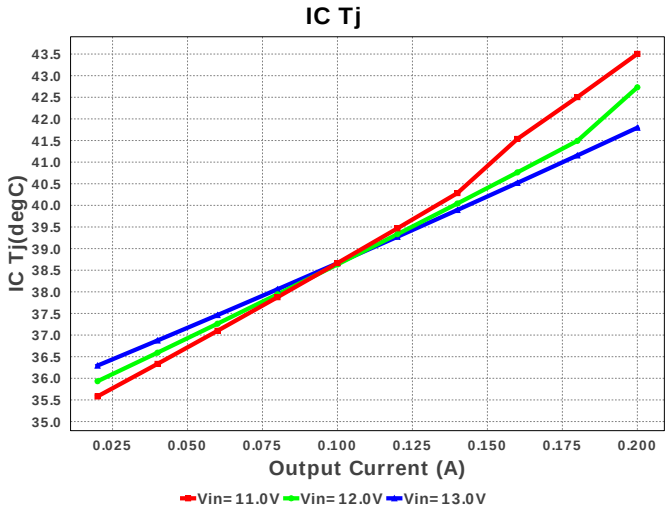


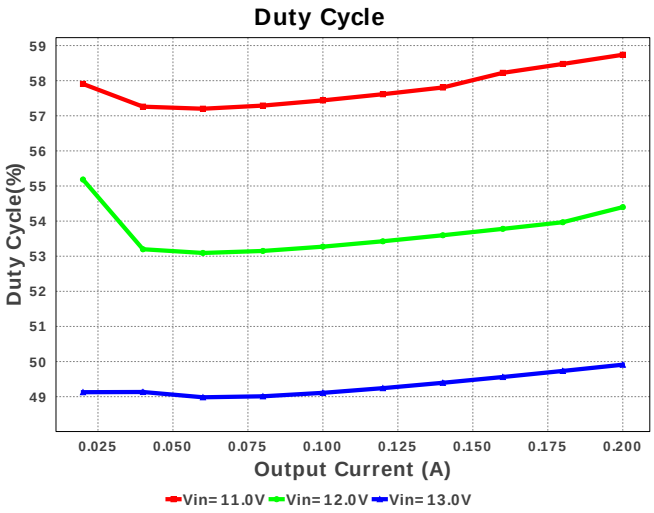
Electrical BOM

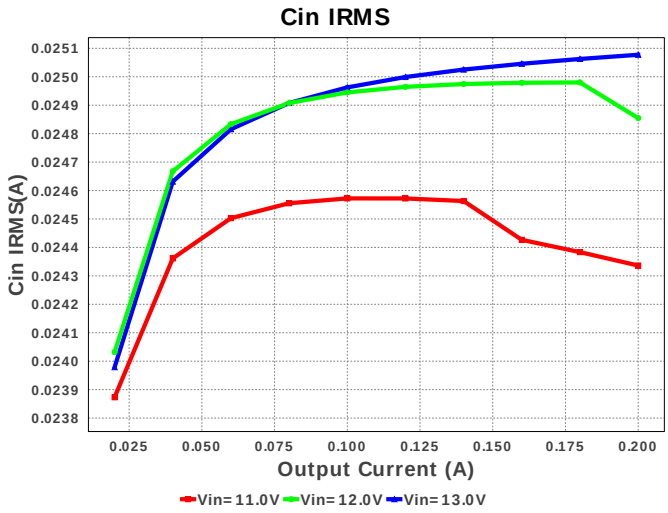
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Ccomp	Taiyo Yuden	EMK212B7105KG-T Series= X7R	Cap= 1.0 uF VDC= 16.0 V IRMS= 0.0 A	1	$0.02	0805 7 mm²
2.	Cin	Panasonic	EEE-FK1E100R Series= FK	Cap= 10.0 uF ESR= 1.35 Ohm VDC= 25.0 V IRMS= 90.0 mA	1	$0.09	SM_RADIAL_B 47 mm²
3.	Cout	Nichicon	UUD1V680MCL1GS Series= uD	Cap= 68.0 uF ESR= 340.0 mOhm VDC= 35.0 V IRMS= 280.0 mA	1	$0.11	SM_RADIAL_6.3BMM 80 mm²
4.	D1	NXP Semiconductor	PMEG6010CEH,115	VF@Io= 570.0 mV VRRM= 60.0 V	1	$0.04	SOD-123F 12 mm²
5.	L1	Bourns	SDR1307-681KL	L= 680.0 µH DCR= 1.0 Ohm	1	$0.35	SDR1307 227 mm²
6.	Rcomp	Vishay-Dale	CRCW0402698RFKED Series= CRCW..e3	Res= 698.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²

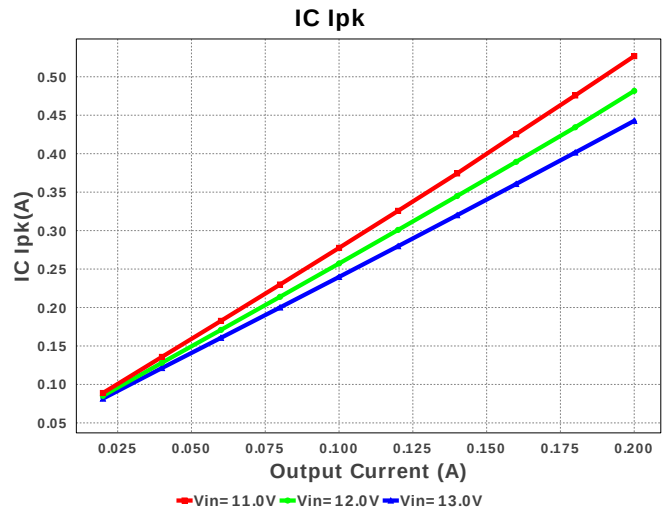
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
7.	Rfb1	Vishay-Dale	CRCW04021K50FKED Series= CRCW..e3	Res= 1.5 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
8.	Rfb2	Vishay-Dale	CRCW040227K4FKED Series= CRCW..e3	Res= 27.4 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
9.	U1	Texas Instruments	LM2585S-ADJ/NOPB	Switcher	1	$3.60	TS5B 199 mm^2

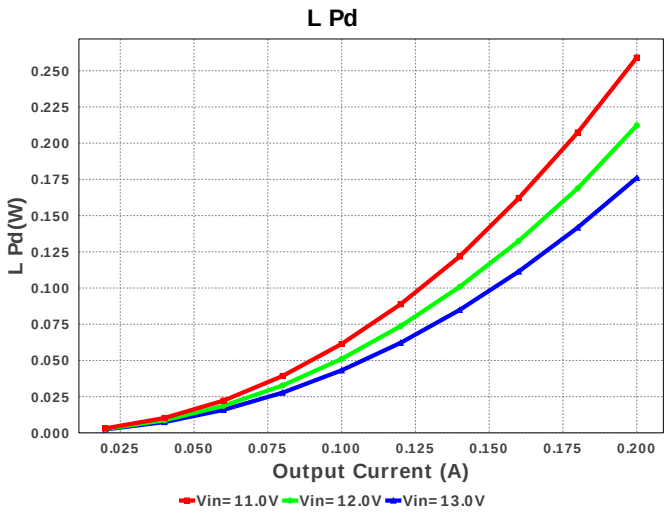


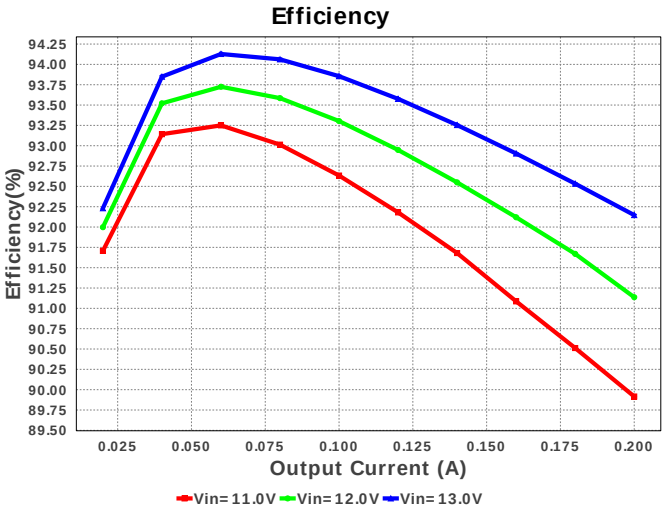


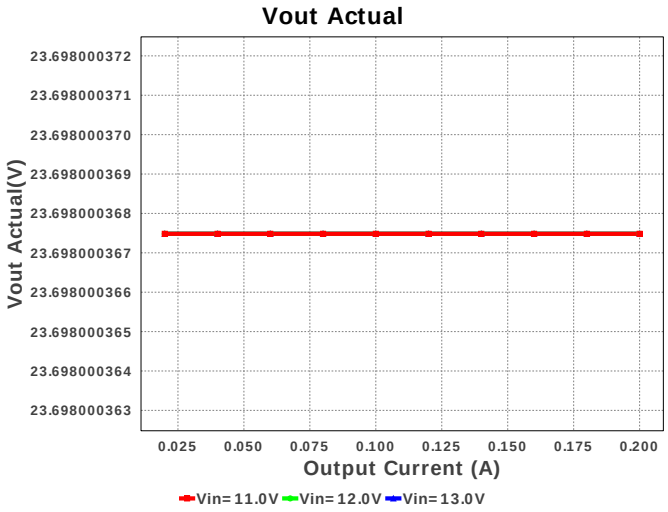


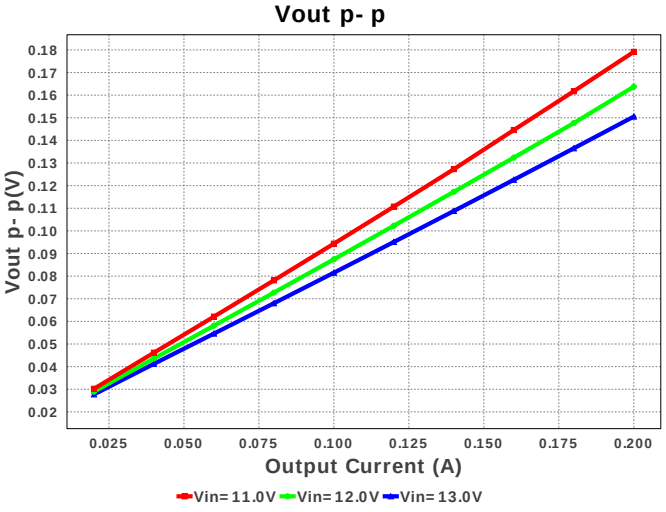


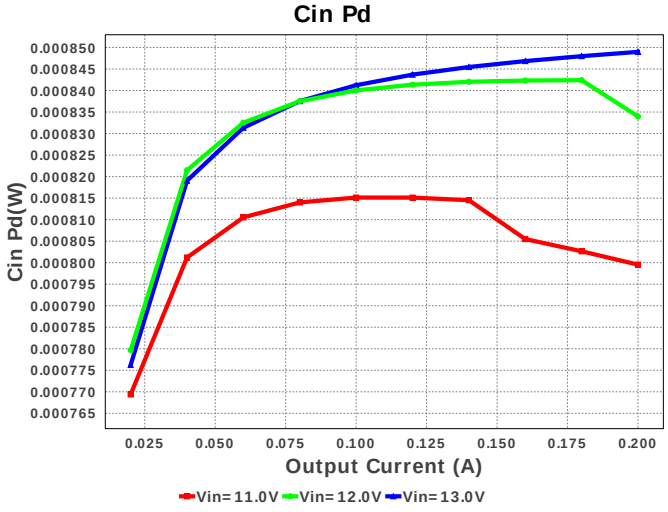


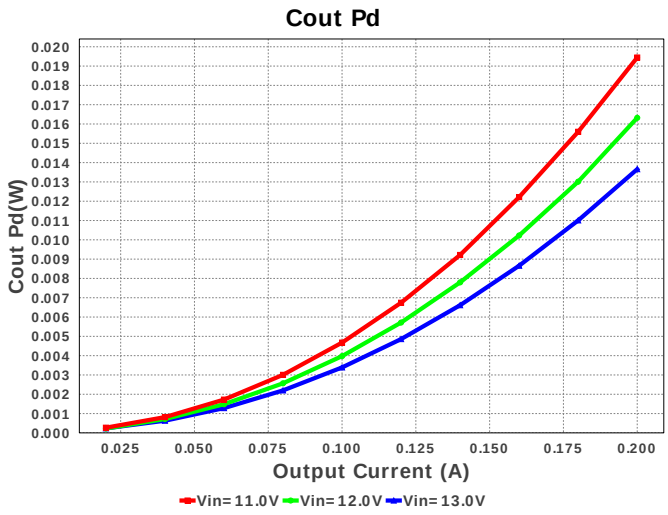


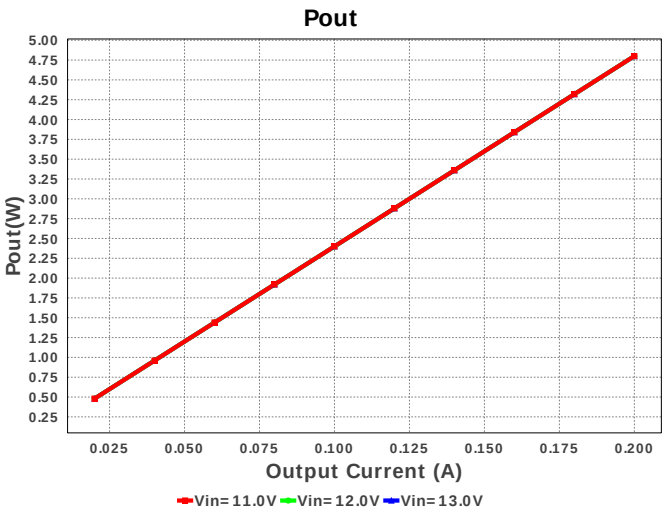


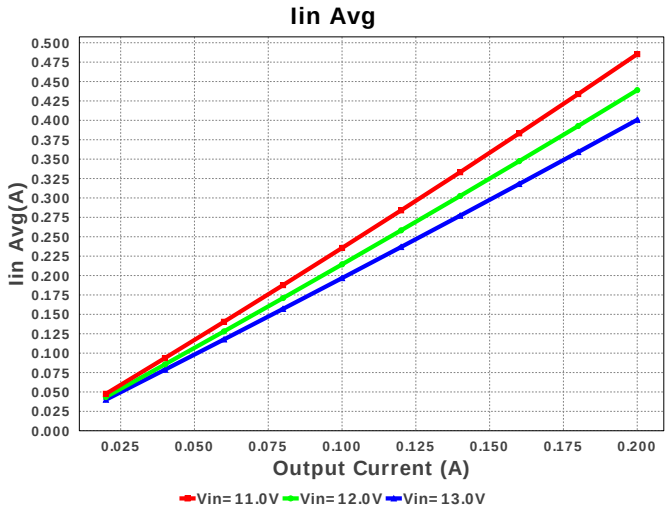


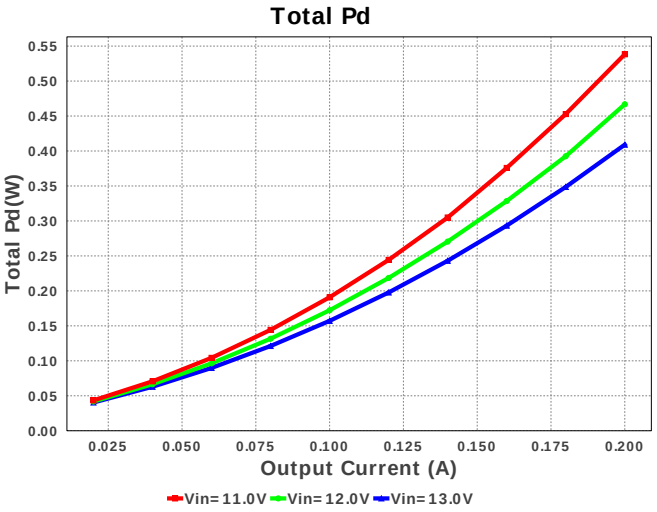


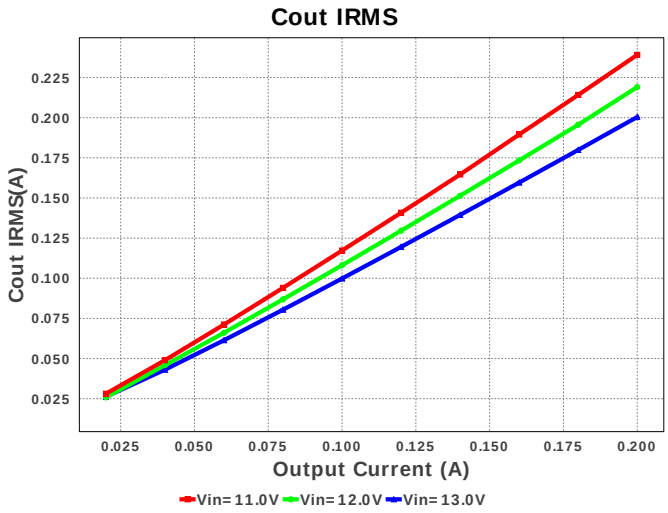


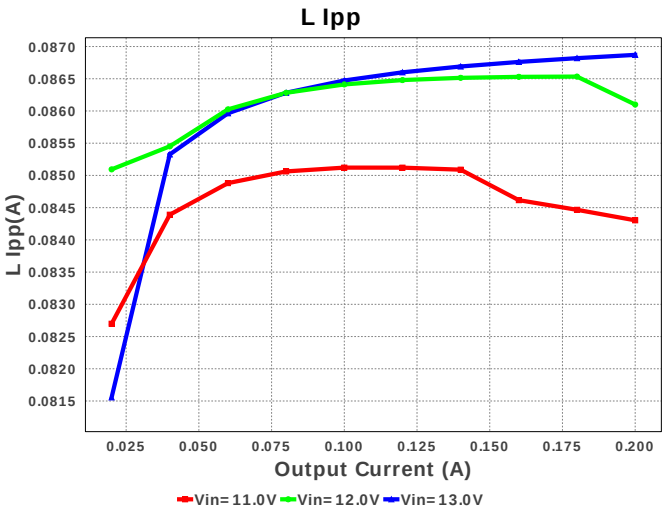


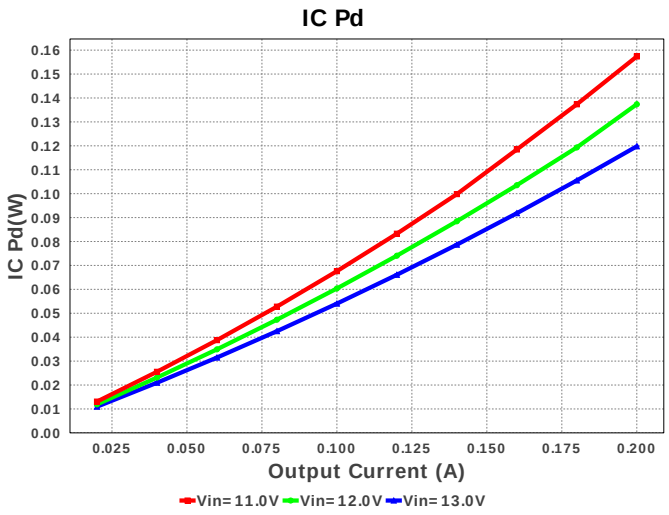


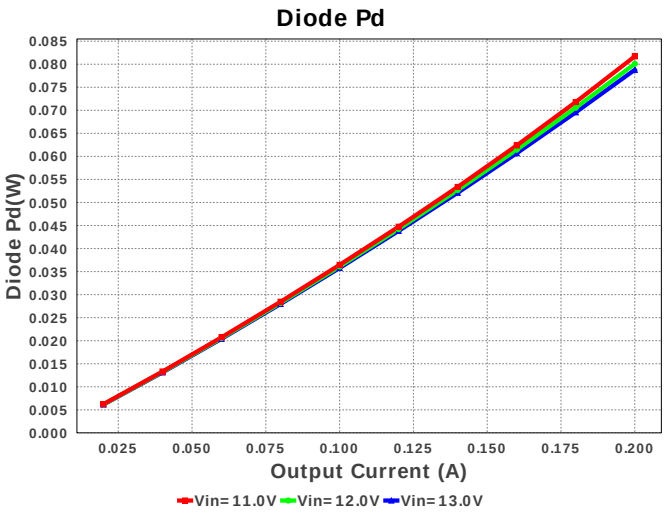


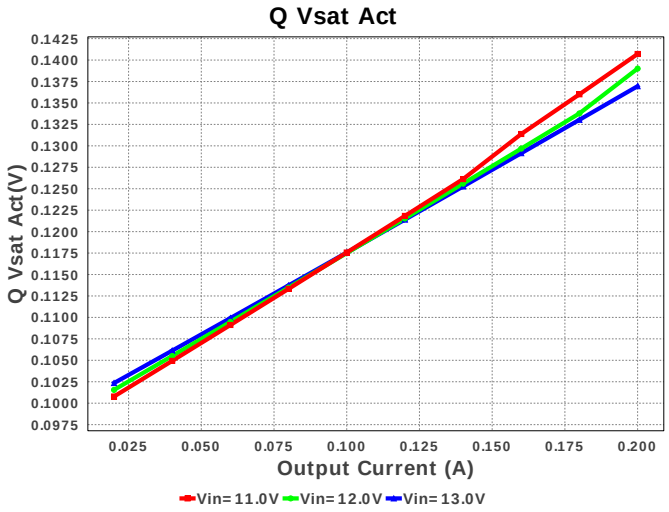


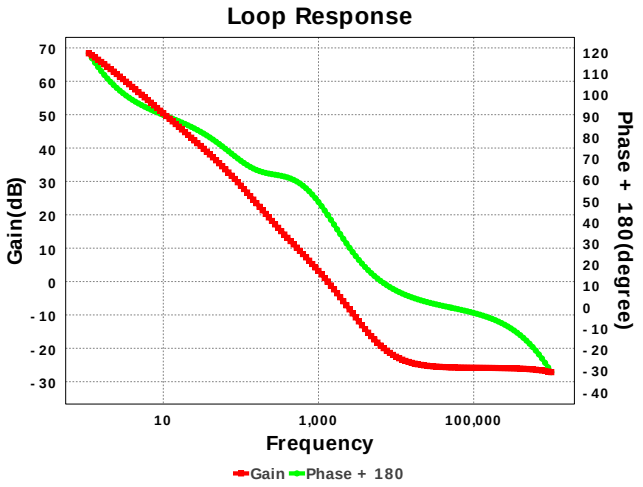












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	24.388 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	241.118 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	531.714 mA	Current	Peak switch current in IC
4.	Iin Avg	489.05 mA	Current	Average input current
5.	L Ipp	84.481 mA	Current	Peak-to-peak inductor ripple current
6.	Q Iavg	489.473 mA	Current	Q Iavg
7.	BOM Count	9	General	Total Design BOM count
8.	FootPrint	580.0 mm^2	General	Total Foot Print Area of BOM components
9.	Frequency	100.0 kHz	General	Switching frequency
10.	IC Tolerance	0.0 V	General	IC Feedback Tolerance
11.	Pout	4.8 W	General	Total output power
12.	Q Vsat Act	143.638 mV	General	Q Vsat
13.	Total BOM	$4.24	General	Total BOM Cost
14.	Low Freq Gain	69.7 dB	Op_Point	Gain at 10Hz
15.	Vout Actual	23.698 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
16.	Cross Freq	1.162 kHz	Op_point	Bode plot crossover frequency
17.	Duty Cycle	59.14 %	Op_point	Duty cycle
18.	Efficiency	89.227 %	Op_point	Steady state efficiency
19.	Gain Marg	-19.57 dB	Op_point	Bode Plot Gain Margin
20.	IC Tj	44.835 degC	Op_point	IC junction temperature
21.	ICThetaJA	40.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
22.	IOUT_OP	200.0 mA	Op_point	Iout operating point
23.	Phase Marg	41.522 deg	Op_point	Bode Plot Phase Margin
24.	VIN_OP	11.0 V	Op_point	Vin operating point
25.	Vout p-p	180.783 mV	Op_point	Peak-to-peak output ripple voltage
26.	Cin Pd	802.924 µW	Power	Input capacitor power dissipation
27.	Cout Pd	19.767 mW	Power	Output capacitor power dissipation
28.	Diode Pd	114.0 mW	Power	Diode power dissipation
29.	IC Pd	160.828 mW	Power	IC power dissipation
30.	L Pd	264.197 mW	Power	Inductor power dissipation
31.	Total Pd	579.539 mW	Power	Total Power Dissipation

#	Name	Value	Category	Description
32.	Vout Tolerance	1.915 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	200.0 m	Maximum Output Current
2.	VinMax	13.0	Maximum input voltage
3.	VinMin	11.0	Minimum input voltage
4.	Vout	24.0	Output Voltage
5.	base_pn	LM2585	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **LM2585** Product Folder : http://www.ti.com/product/LM2585 : contains the data sheet and other resources.