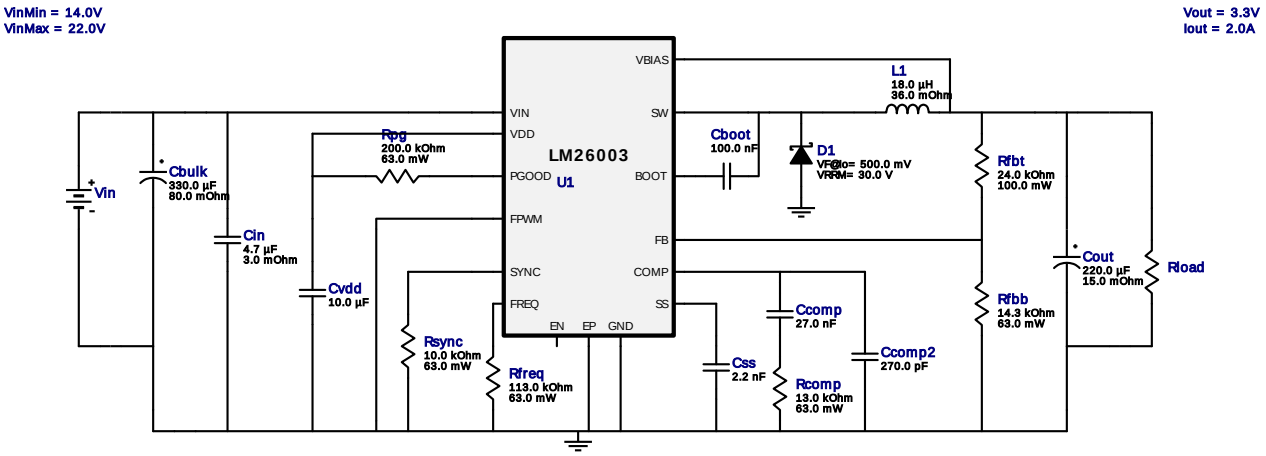
WEBENCH® Design Report

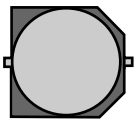
VinMin = 14.0V
VinMax = 22.0V
Vout = 3.3V
Iout = 2.0A

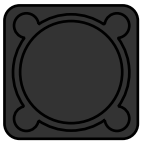
Device = LM26003MH/NOPB
Topology = Buck
Created = 6/6/14 12:51:16 AM
BOM Cost = $3.21
Footprint = 607.0mm2
BOM Count = 17
Total Pd = 1.18W

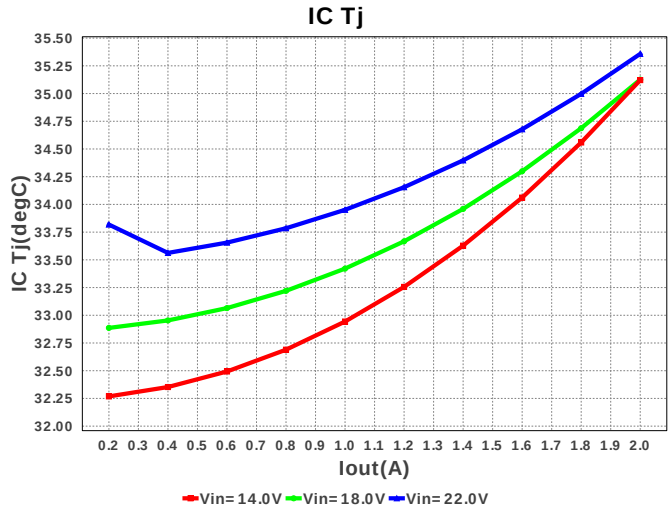
Design : 3844822/291 LM26003MH/NOPB
LM26003MHX/NOPB 14.0V-22.0V to 3.3V @ 2.0A

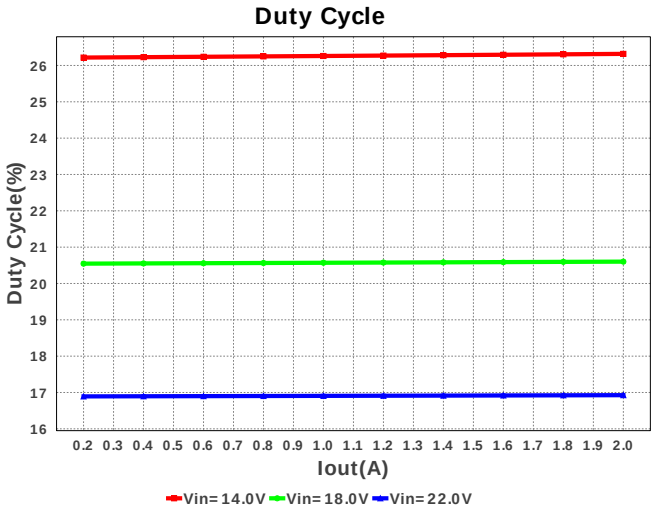


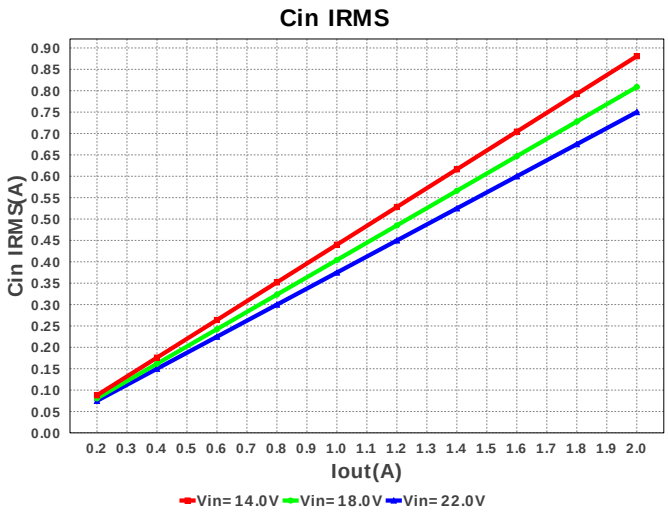
Electrical BOM

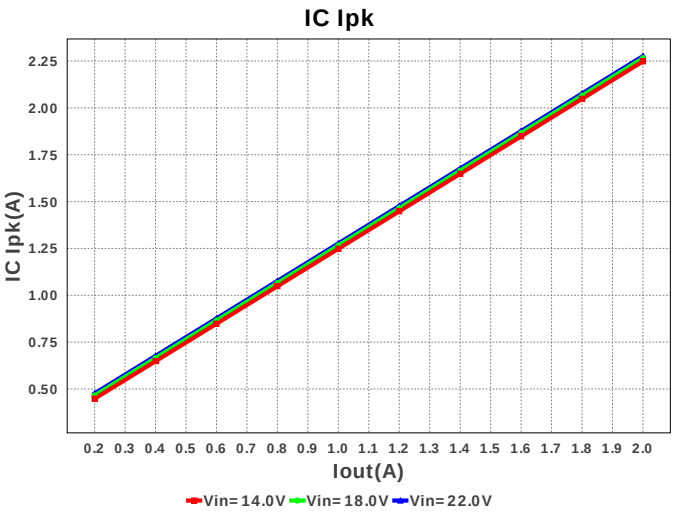
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	MuRata	GRM21BR71E104KA01L Series= X7R	Cap= 100.0 nF VDC= 25.0 V IRMS= 0.0 A	1	$0.01	 0805 7mm2
2.	Cbulk	Panasonic	EEE-FK1V331P Series= FK	Cap= 330.0 µF ESR= 80.0 mOhm VDC= 35.0 V IRMS= 850.0 mA	1	$0.28	 SM_RADIAL_G 172mm2
3.	Ccomp	Yageo America	CC0805KRX7R9BB273 Series= X7R	Cap= 27.0 nF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	 0805 7mm2
4.	Ccomp2	Yageo America	CC0805KRX7R9BB271 Series= X7R	Cap= 270.0 pF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	 0805 7mm2
5.	Cin	MuRata	GRM31CR71H475KA12L Series= X7R	Cap= 4.7 µF ESR= 3.0 mOhm VDC= 50.0 V IRMS= 4.98 A	1	$0.10	 1206 11mm2
6.	Cout	Panasonic	6SVPE220MW Series= 259	Cap= 220.0 µF ESR= 15.0 mOhm VDC= 6.3 V IRMS= 3.15 A	1	$0.14	 CAPSMT_62_E61 53mm2
7.	Css	Yageo America	CC0805KRX7R9BB222 Series= X7R	Cap= 2.2 nF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	 0805 7mm2
8.	Cvdd	Samsung Electro-Mechanics	CL10A106MQ8NNNC Series= X5R	Cap= 10.0 µF VDC= 6.3 V IRMS= 0.0 A	1	$0.02	 0603 5mm2
9.	D1	Diodes Inc.	B130-13-F	VF@Io= 500.0 mV VRRM= 30.0 V	1	$0.06	 SMA 37mm2

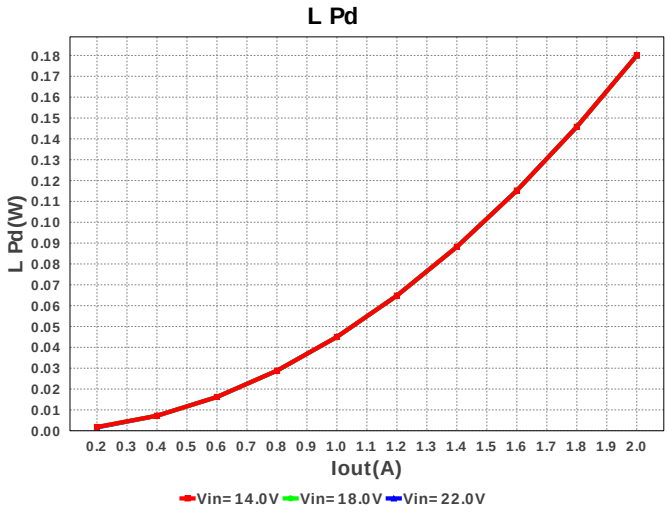
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
10.	L1	Bourns	SRR1260-180M	L= 18.0 µH DCR= 36.0 mOhm	1	$0.41	 SRR1260 210mm2
11.	Rcomp	Vishay-Dale	CRCW040213K0FKED Series= CRCW..e3	Res= 13.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	 0402 3mm2
12.	Rfbb	Vishay-Dale	CRCW040214K3FKED Series= CRCW..e3	Res= 14.3 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	 0402 3mm2
13.	Rfbt	Yageo America	RC0603FR-0724KL Series= 233	Res= 24.0 kOhm Power= 100.0 mW Tolerance= 1.0%	1	$0.01	 0603 5mm2
14.	Rfreq	Vishay-Dale	CRCW0402113KFKED Series= CRCW..e3	Res= 113.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	 0402 3mm2
15.	Rpg	Vishay-Dale	CRCW0402200KFKED Series= CRCW..e3	Res= 200.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	 0402 3mm2
16.	Rsync	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	 0402 3mm2
17.	U1	Texas Instruments	LM26003MHX/NOPB	Switcher	1	$2.10	 MXA20A 71mm2

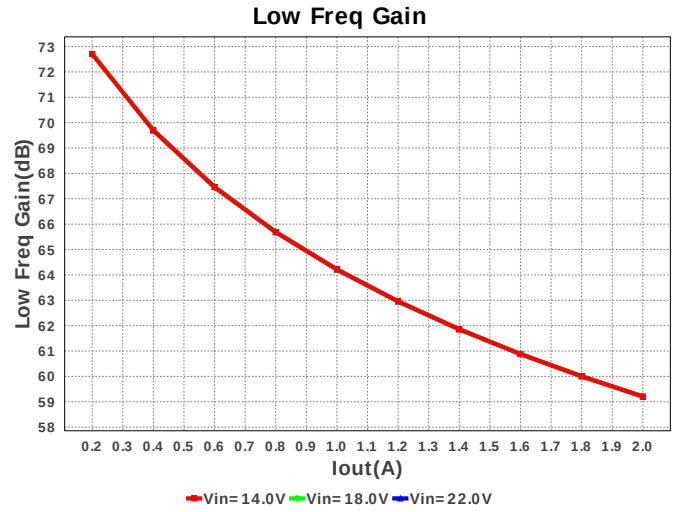


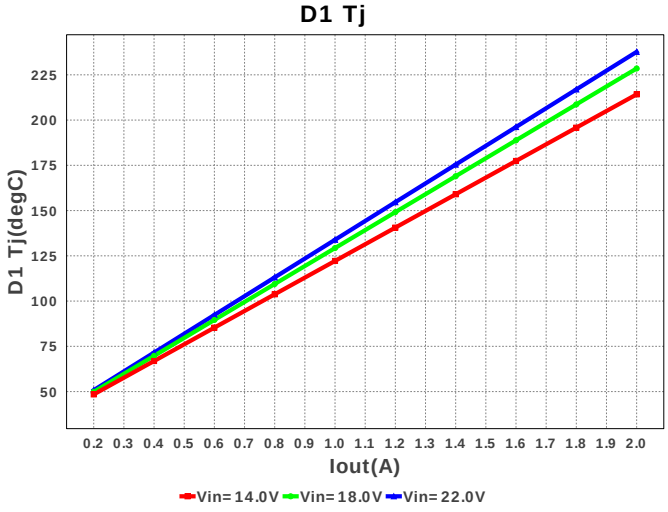


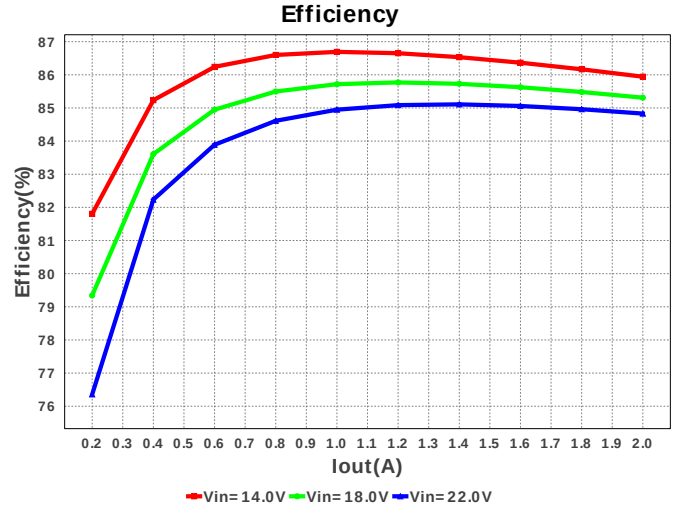


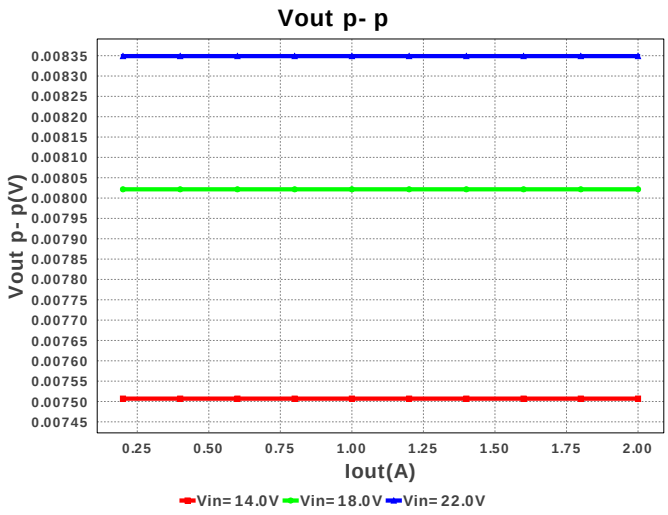


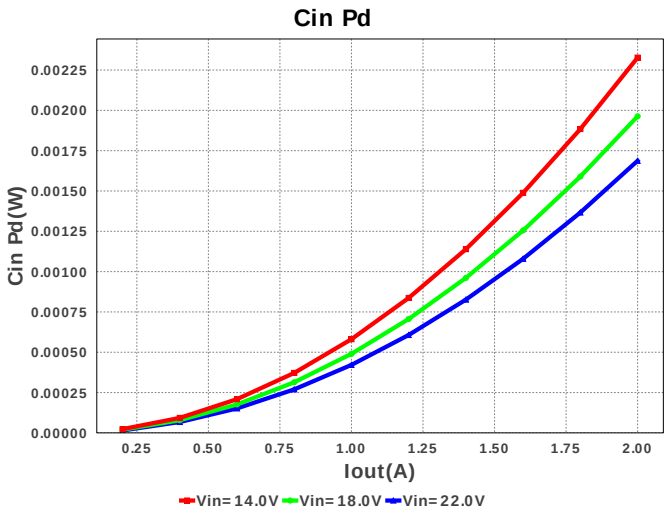


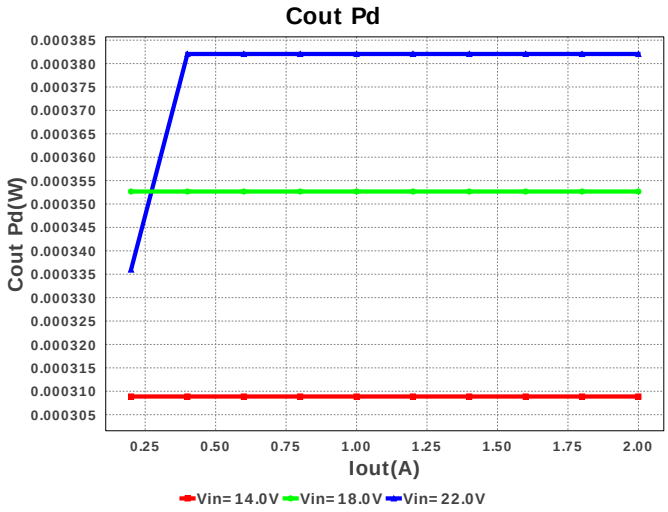


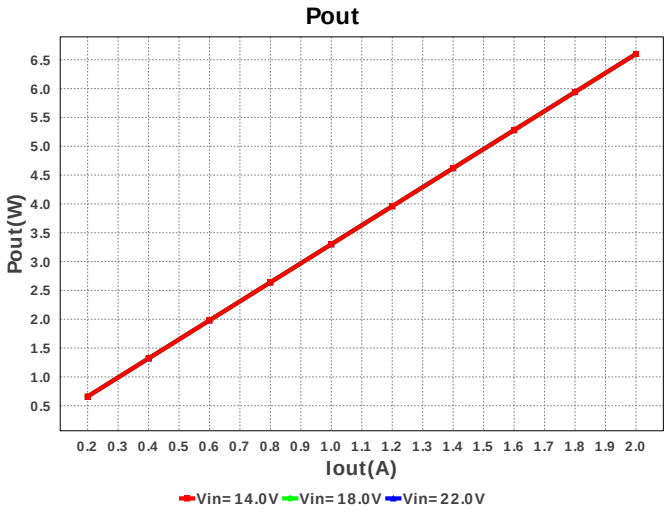


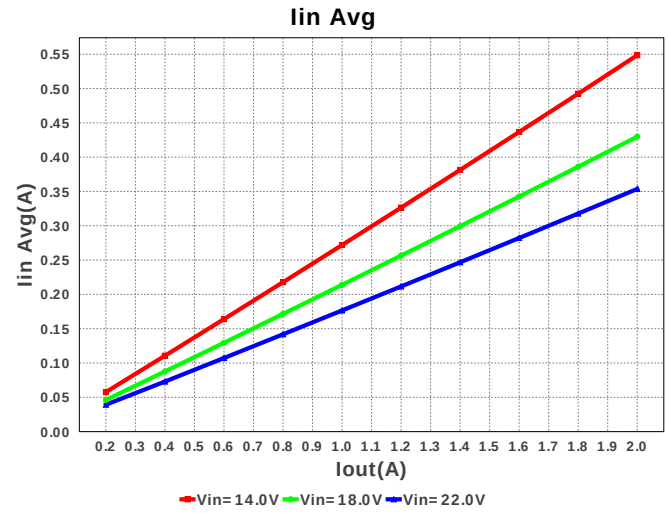


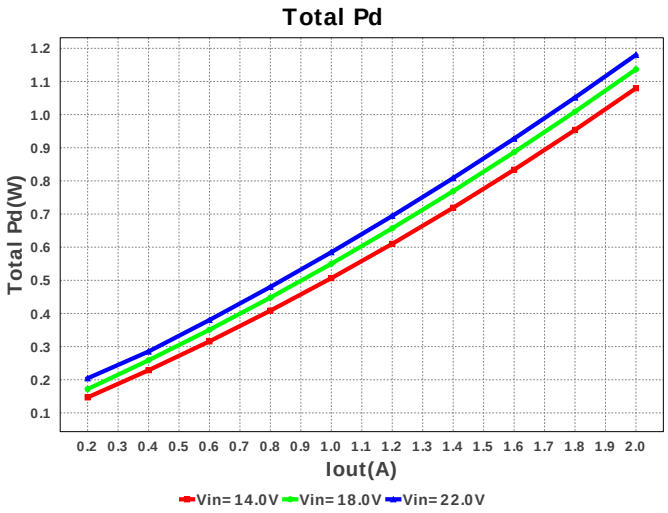


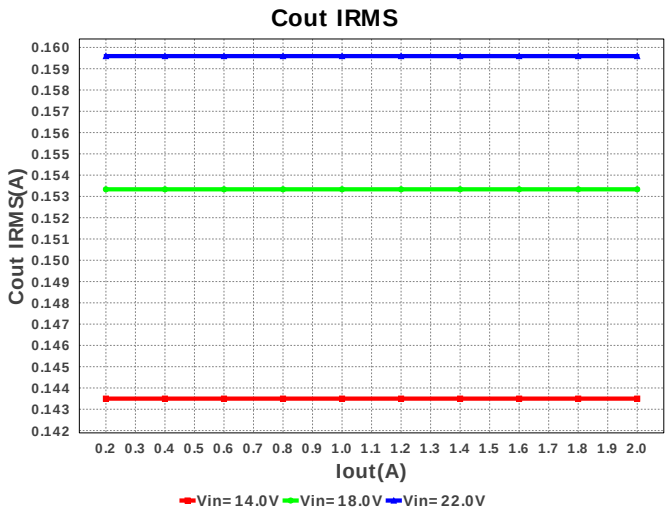


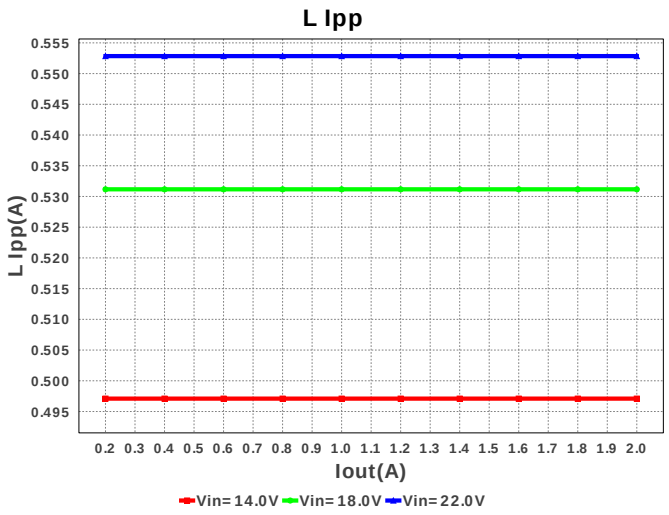


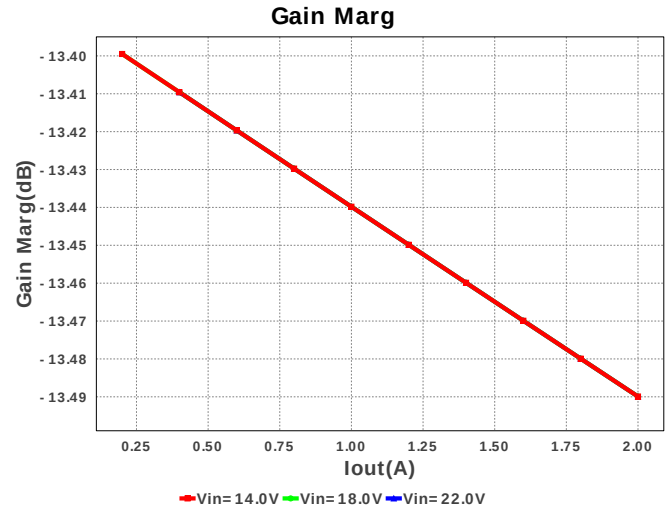


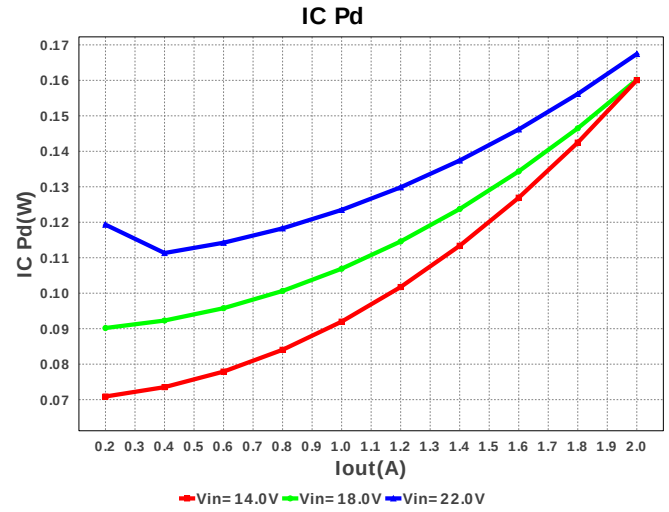


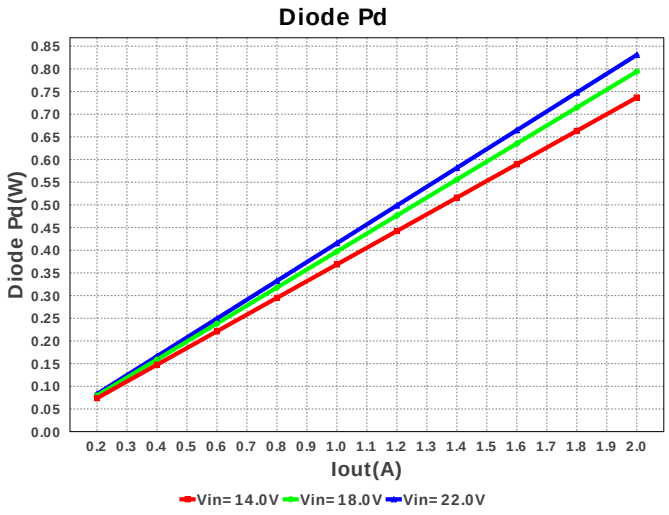


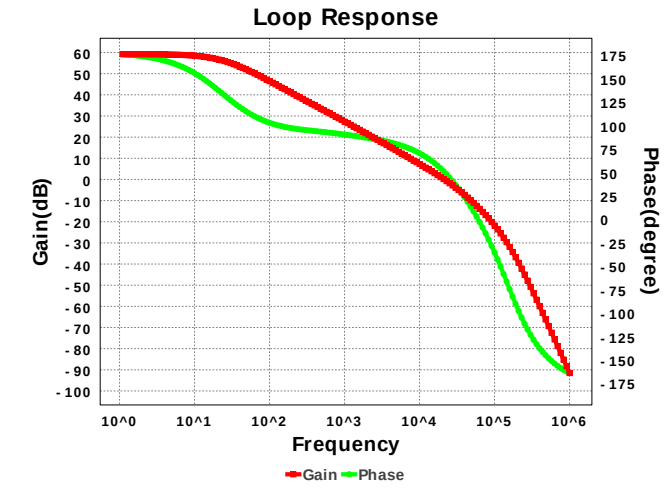












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	749.967 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	159.388 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	2.276 A	Current	Peak switch current in IC
4.	Iin Avg	353.65 mA	Current	Average input current
5.	L Ipp	552.137 mA	Current	Peak-to-peak inductor ripple current
6.	BOM Count	17	General	Total Design BOM count
7.	FootPrint	607.0 mm2	General	Total Foot Print Area of BOM components
8.	Frequency	325.0 kHz	General	Switching frequency
9.	Pout	6.6 W	General	Total output power
10.	Total BOM	$3.21	General	Total BOM Cost
11.	D1 Tj	237.684 degC	Op_Point	D1 junction temperature

#	Name	Value	Category	Description
12.	Vout OP	3.3 V	Op_Point	Operational Output Voltage
13.	Cross Freq	21.23 kHz	Op_point	Bode plot crossover frequency
14.	Duty Cycle	16.926 %	Op_point	Duty cycle
15.	Efficiency	84.829 %	Op_point	Steady state efficiency
16.	Gain Marg	-13.5 dB	Op_point	Bode Plot Gain Margin
17.	IC Tj	35.362 degC	Op_point	IC junction temperature
18.	ICThetaJA	32.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
19.	IOUT_OP	2.0 A	Op_point	Iout operating point
20.	Phase Marg	51.978 deg	Op_point	Bode Plot Phase Margin
21.	VIN_OP	22.0 V	Op_point	Vin operating point
22.	Vout p-p	8.338 mV	Op_point	Peak-to-peak output ripple voltage
23.	Cin Pd	1.687 mW	Power	Input capacitor power dissipation
24.	Cout Pd	381.069 µW	Power	Output capacitor power dissipation
25.	Diode Pd	830.737 mW	Power	Diode power dissipation
26.	IC Pd	167.575 mW	Power	IC power dissipation
27.	L Pd	180.0 mW	Power	Inductor power dissipation
28.	Total Pd	1.18 W	Power	Total Power Dissipation
29.	Low Freq Gain	59.209 dB	Unknown	Gain at 10Hz

Design Inputs

#	Name	Value	Description
1.	Iout	2.0 A	Maximum Output Current
2.	Iout1	2.0 Amps	Output Current #1
3.	VinMax	22.0 V	Maximum input voltage
4.	VinMin	14.0 V	Minimum input voltage
5.	Vout	3.3 V	Output Voltage
6.	Vout1	3.3 Volt	Output Voltage #1
7.	base_pn	LM26003	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	ta	30.0 degC	Ambient temperature

Design Assistance

1. LM26003 Product Folder : http://www.ti.com/product/lm26003 : contains the data sheet and other resources.