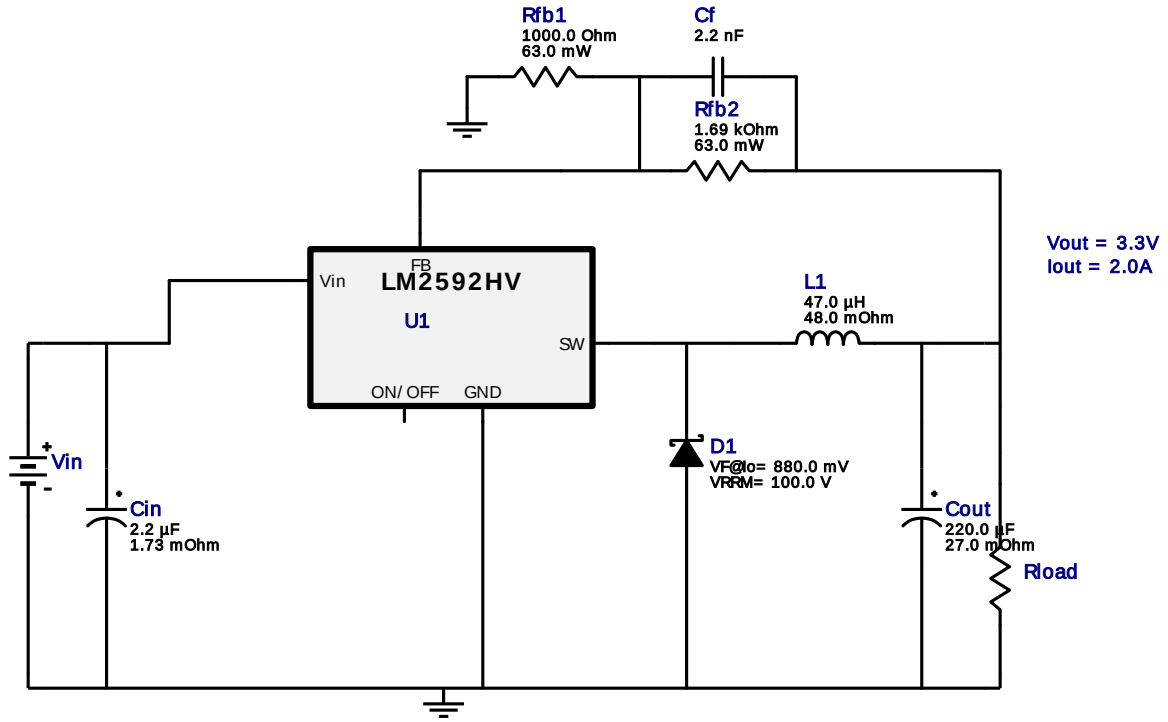
WEBENCH® Design Report

VinMin = 20.0V
VinMax = 50.0V
Vout = 3.3V
Iout = 2.0A

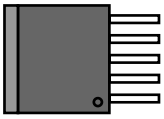
Device = LM2592HVSX-ADJ/NOPB
Topology = Buck
Created = 8/12/16 12:53:21 AM
BOM Cost = $4.09
BOM Count = 9
Total Pd = 3.11W

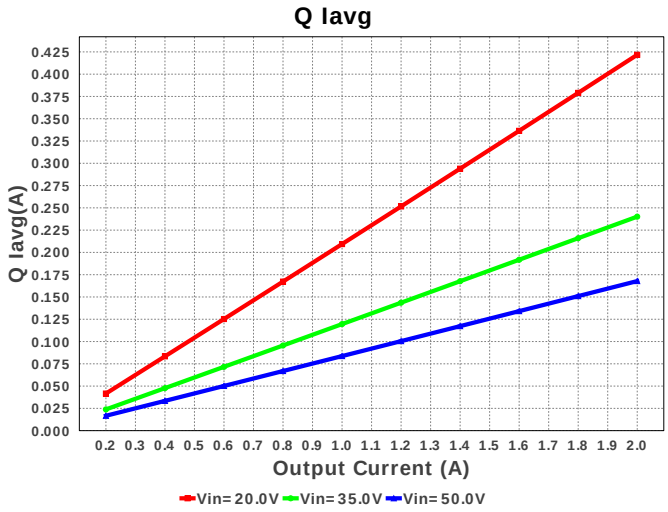
Design : 4766207/7 LM2592HVSX-ADJ/NOPB
LM2592HVSX-ADJ/NOPB 20.0V-50.0V to 3.30V @ 2.0A

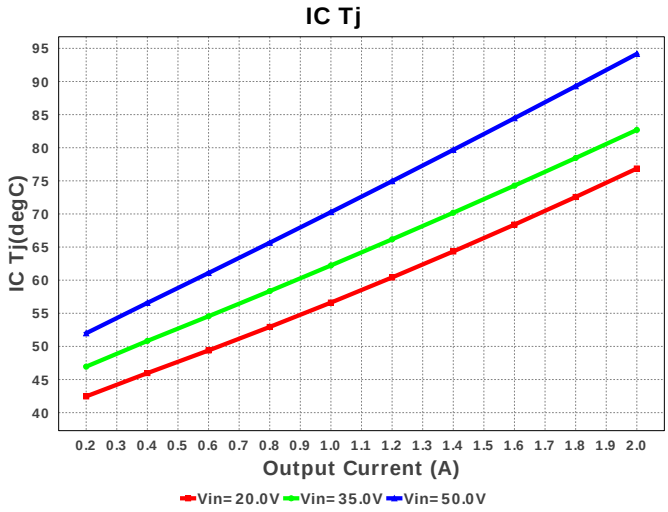


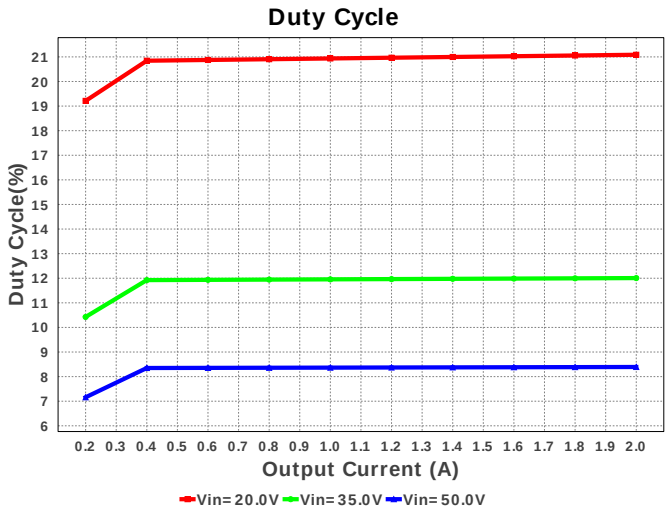
Electrical BOM

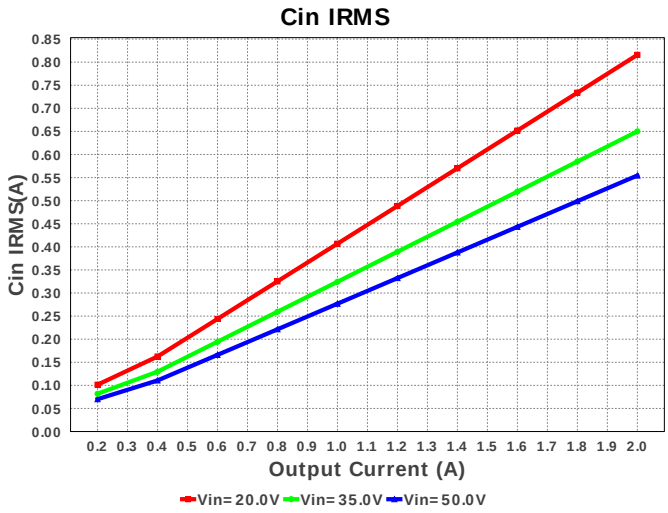
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cf	Yageo America	CC0805KRX7R9BB222 Series= X7R	Cap= 2.2 nF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 7 mm²
2.	Cin	TDK	C3225X7R2A225K230AB Series= X7R	Cap= 2.2 uF ESR= 1.73 mOhm VDC= 100.0 V IRMS= 5.5932 A	1	$0.19	1210_250 15 mm²
3.	Cout	Panasonic	6SVPC220M Series= SVPC	Cap= 220.0 uF ESR= 27.0 mOhm VDC= 6.3 V IRMS= 2.32 A	1	$0.29	SM_RADIAL_6.3AMM 80 mm²
4.	D1	Vishay-Semiconductor	SS10PH10-M3/86A	VF@Io= 880.0 mV VRRM= 100.0 V	1	$0.29	TO-277A 56 mm²
5.	Dfb	Vishay-Semiconductor	SS12-E3/61T	VF@Io= 500.0 mV VRRM= 20.0 V	1	$0.08	SMA 37 mm²
6.	L1	Coilcraft	MSS1210-473MEB	L= 47.0 µH DCR= 48.0 mOhm	1	$0.81	MSS1210 204 mm²

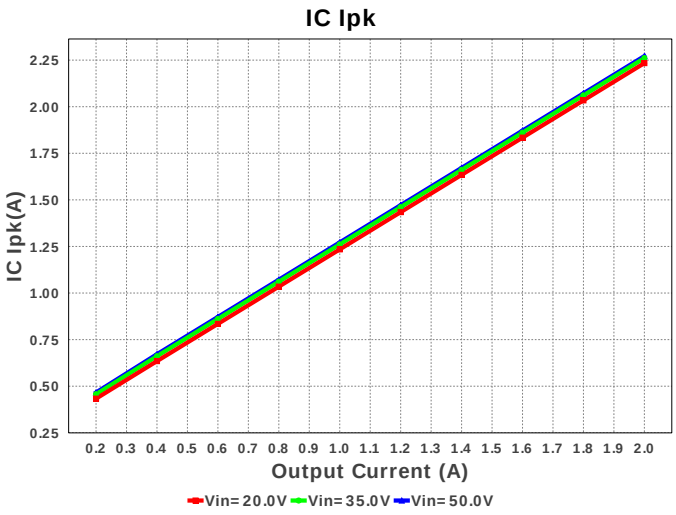
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
7.	Rfb1	Vishay-Dale	CRCW04021K00FKED Series= CRCW..e3	Res= 1000.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
8.	Rfb2	Vishay-Dale	CRCW04021K69FKED Series= CRCW..e3	Res= 1.69 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
9.	U1	Texas Instruments	LM2592HVSX-ADJ/NOPB	Switcher	1	$2.40	 TS5B 199 mm^2

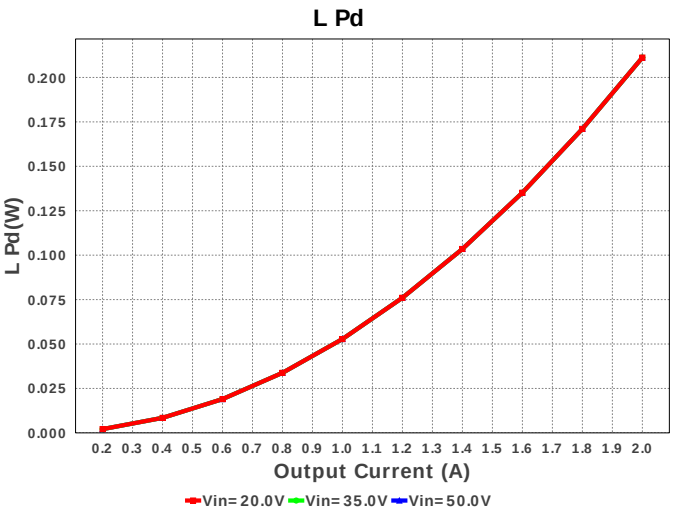


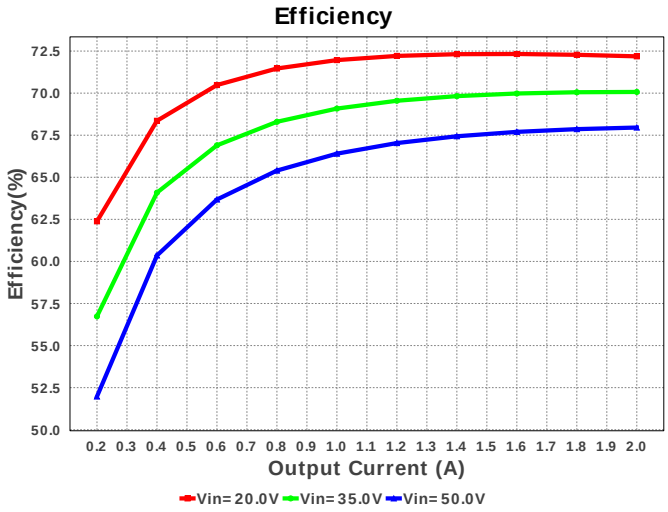


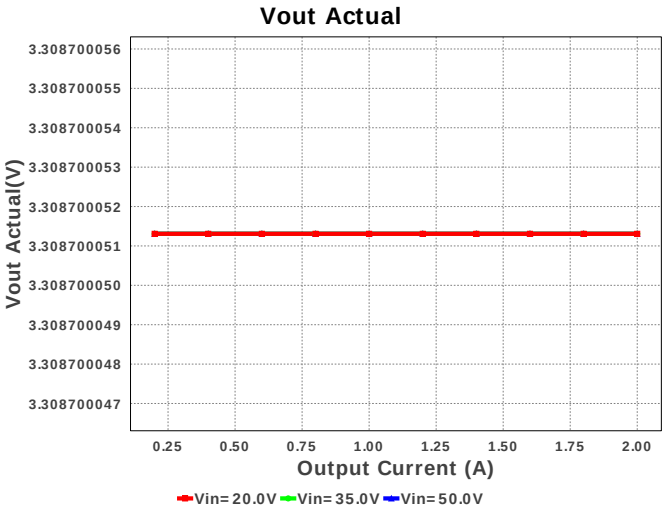


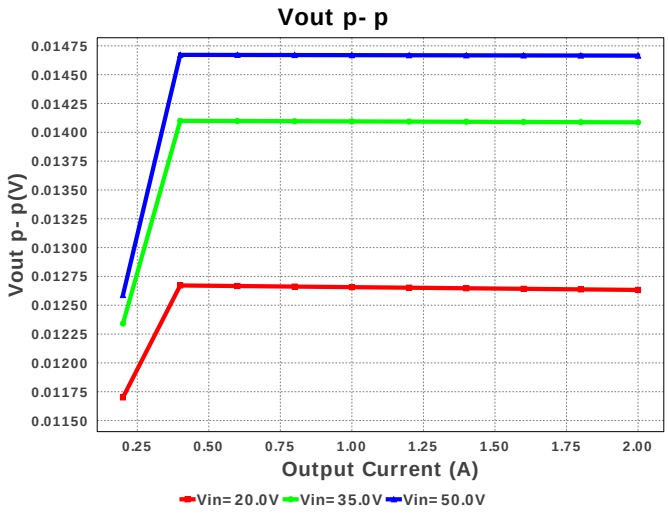


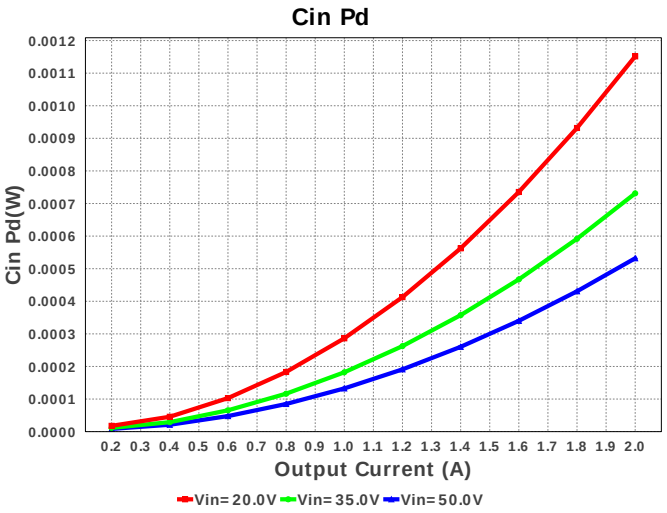


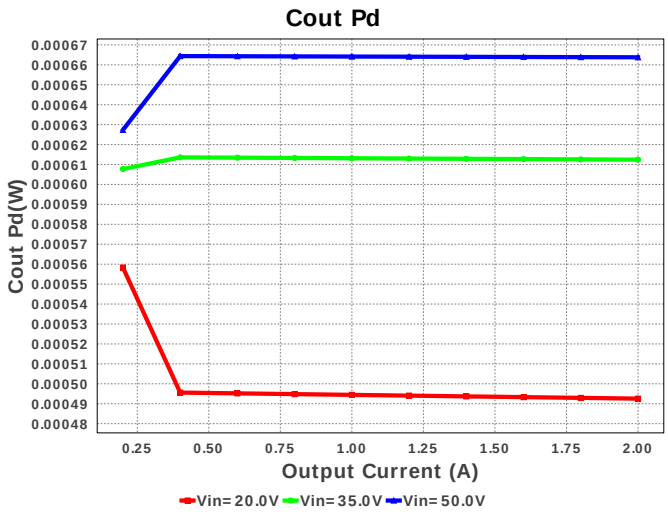


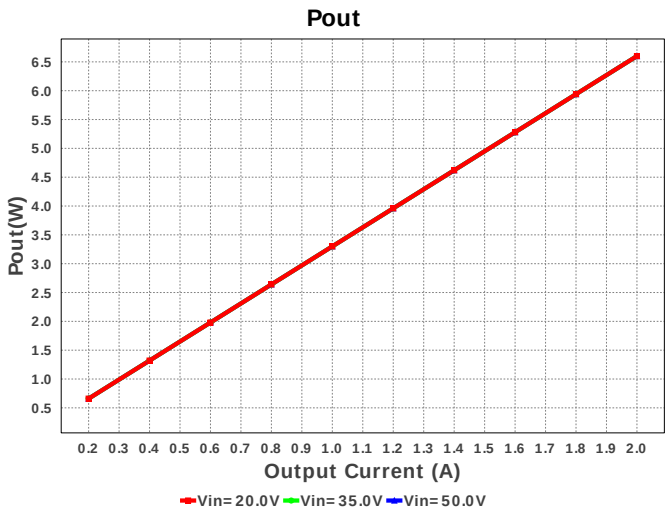


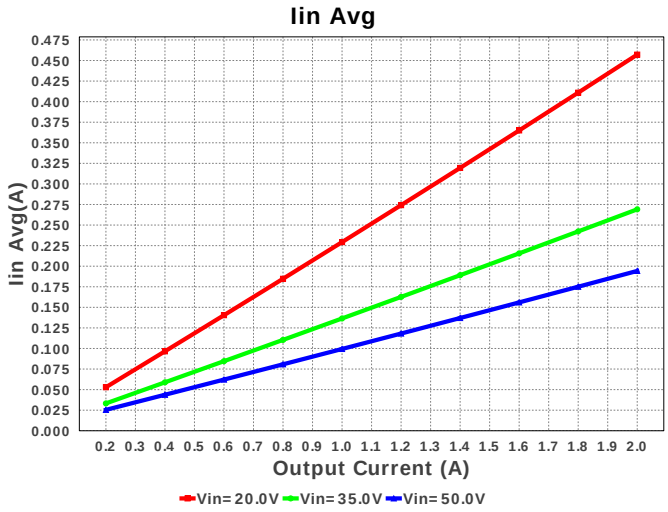


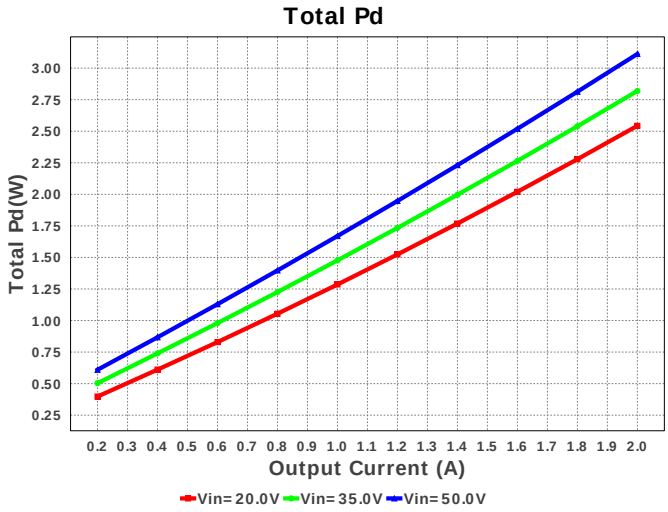


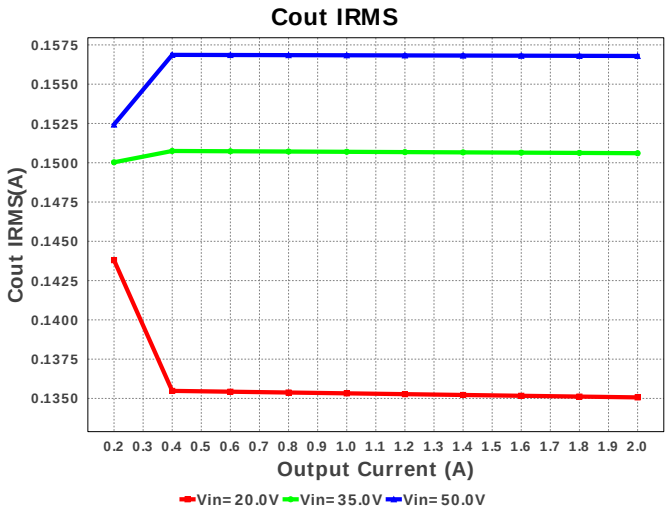


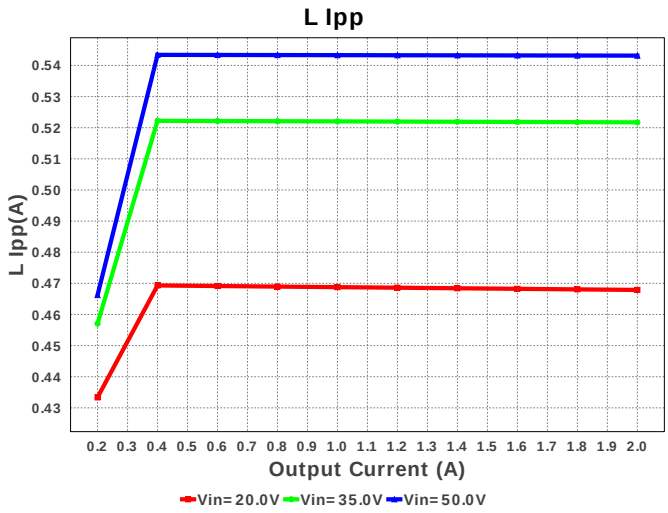


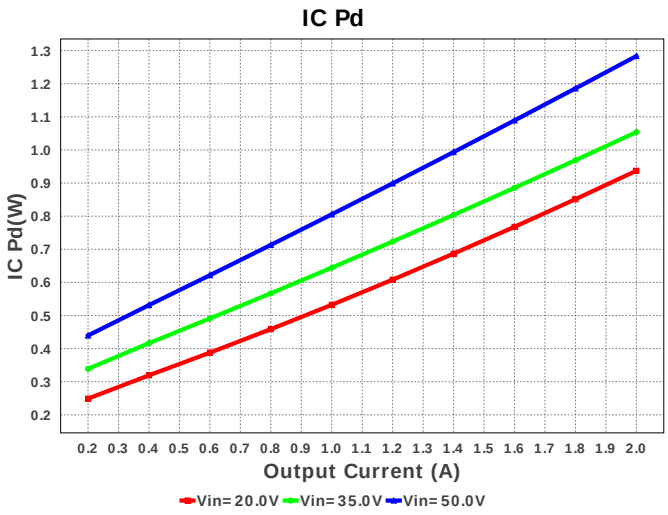


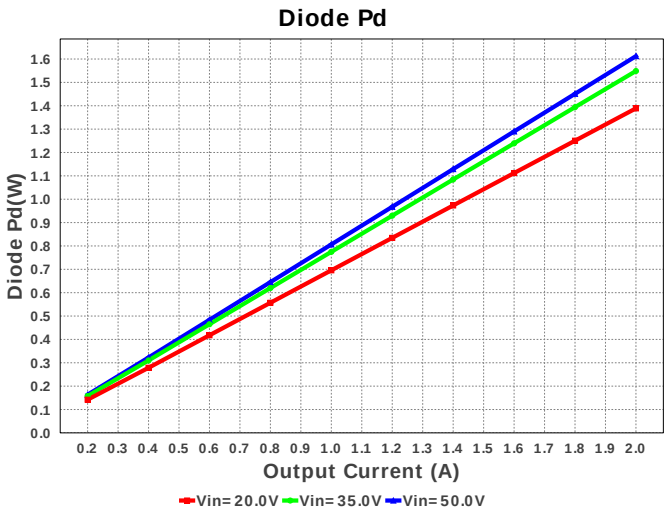


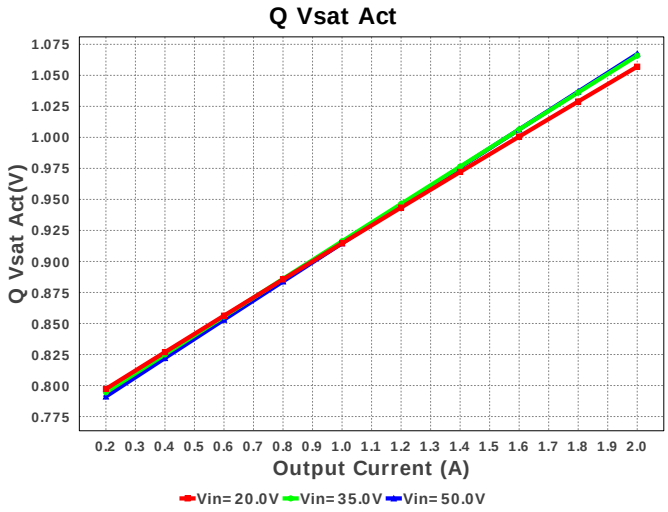












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	554.518 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	156.795 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	2.272 A	Current	Peak switch current in IC
4.	Iin Avg	194.24 mA	Current	Average input current
5.	L Ipp	543.15 mA	Current	Peak-to-peak inductor ripple current
6.	Q Iavg	167.828 mA	Current	Q Iavg
7.	BOM Count	9	General	Total Design BOM count
8.	FootPrint	604.0 mm^2	General	Total Foot Print Area of BOM components
9.	Frequency	150.0 kHz	General	Switching frequency
10.	IC Tolerance	0.0 V	General	IC Feedback Tolerance
11.	Mode	CCM	General	Conduction Mode
12.	Pout	6.6 W	General	Total output power
13.	Q Vsat Act	1.067 V	General	Q Vsat
14.	Total BOM	$4.09	General	Total BOM Cost
15.	Vout Actual	3.309 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
16.	Cross Freq	20.893 kHz	Op_point	Bode plot crossover frequency
17.	Duty Cycle	8.391 %	Op_point	Duty cycle
18.	Efficiency	67.956 %	Op_point	Steady state efficiency
19.	IC Tj	94.17 degC	Op_point	IC junction temperature
20.	ICThetaJA	50.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
21.	IOUT_OP	2.0 A	Op_point	Iout operating point
22.	Phase Marg	52.149 deg	Op_point	Bode Plot Phase Margin
23.	VIN_OP	50.0 V	Op_point	Vin operating point
24.	Vout p-p	14.665 mV	Op_point	Peak-to-peak output ripple voltage
25.	Cin Pd	531.959 µW	Power	Input capacitor power dissipation
26.	Cout Pd	663.788 µW	Power	Output capacitor power dissipation
27.	Diode Pd	1.612 W	Power	Diode power dissipation
28.	IC Pd	1.283 W	Power	IC power dissipation
29.	L Pd	211.2 mW	Power	Inductor power dissipation
30.	Total Pd	3.112 W	Power	Total Power Dissipation

#	Name	Value	Category	Description
31.	Vout Tolerance	1.269 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	2.0	Maximum Output Current
2.	VinMax	50.0	Maximum input voltage
3.	VinMin	20.0	Minimum input voltage
4.	Vout	3.3	Output Voltage
5.	base_pn	LM2592HV	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **LM2592HV** Product Folder : http://www.ti.com/product/LM2592HV : contains the data sheet and other resources.