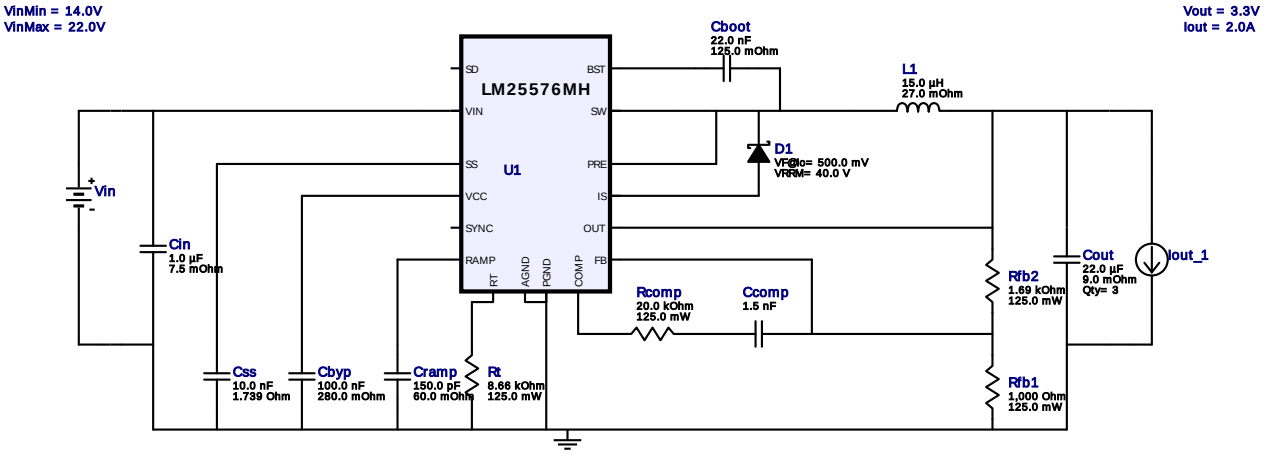
VinMin = 14.0V
VinMax = 22.0V
Vout = 3.3V
Iout = 2.0A

Device = LM25576MH/NOPB
Topology = Buck
Created = 6/5/14 10:50:24 PM
BOM Cost = $2.80
Footprint = 457.0mm2
BOM Count = 16
Total Pd = 1.21W

WEBENCH® Design Report

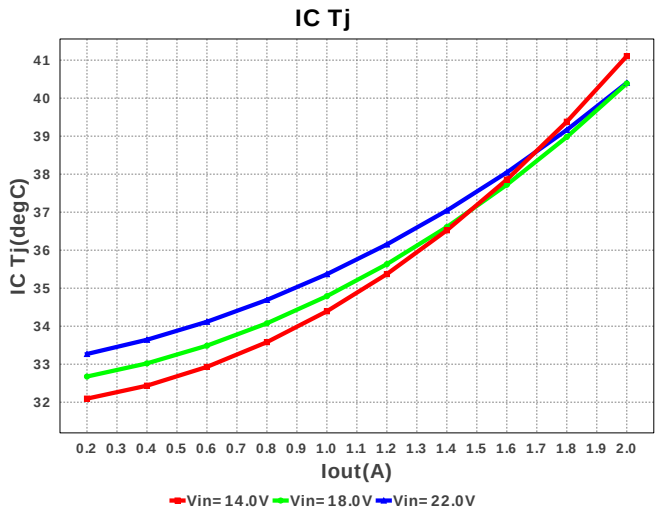
Design : 3980125/10 LM25576MH/NOPB
LM25576MHX/NOPB 14.0V-22.0V to 3.3V @ 2.0A

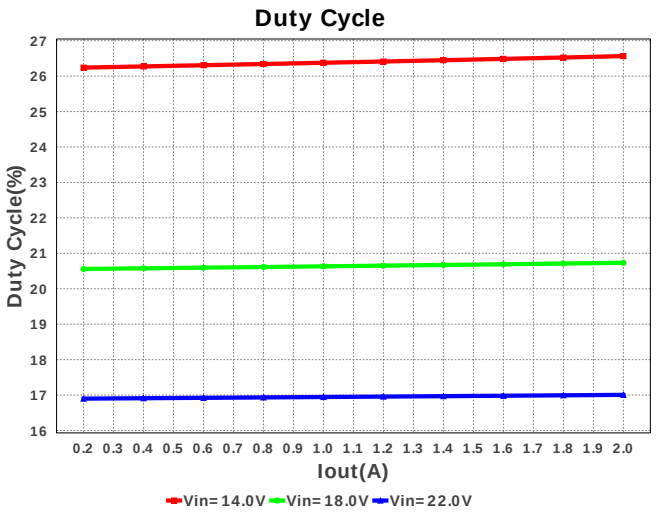


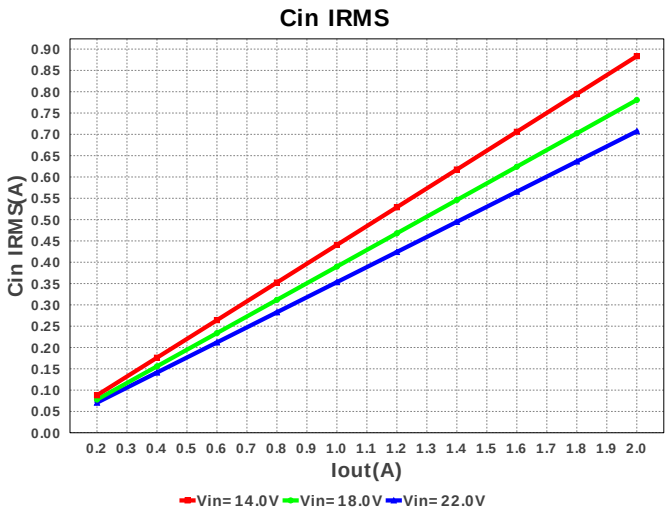
Electrical BOM

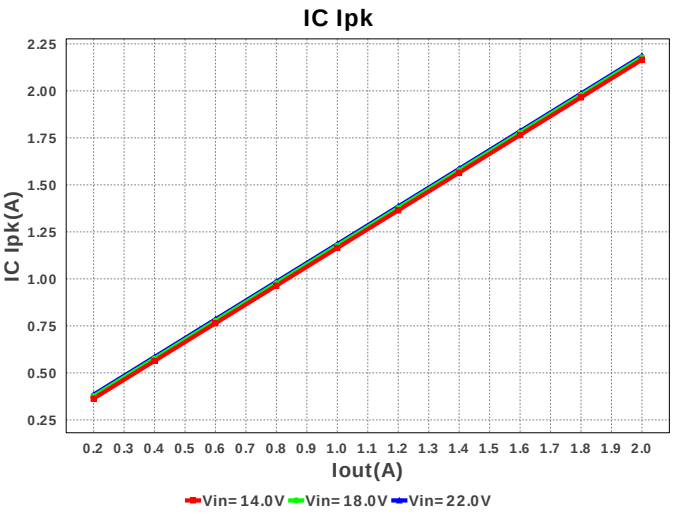
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	Kemet	C0805C223K5RACTU Series= X7R	Cap= 22.0 nF ESR= 125.0 mOhm VDC= 50.0 V IRMS= 645.0 mA	1	$0.01	0805 7mm2
2.	Cbyp	AVX	08053C104KAT2A Series= X7R	Cap= 100.0 nF ESR= 280.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	$0.01	0805 7mm2
3.	Ccomp	Yageo America	CC0805KRX7R9BB152 Series= X7R	Cap= 1.5 nF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 7mm2
4.	Cin	TDK	C3216X7R2A105M160AA Series= X7R	Cap= 1.0 µF ESR= 7.5 mOhm VDC= 100.0 V IRMS= 5.923 A	1	$0.11	1206 11mm2
5.	Cout	MuRata	GRM21BR60J226ME39L Series= X5R	Cap= 22.0 µF ESR= 9.0 mOhm VDC= 6.3 V IRMS= 3.5 A	3	$0.03	0805 7mm2
6.	Cramp	Kemet	C0805C151J5GACTU Series= C0G/NP0	Cap= 150.0 pF ESR= 60.0 mOhm VDC= 50.0 V IRMS= 676.0 mA	1	$0.01	0805 7mm2
7.	Css	Kemet	C0805C103K5RACTU Series= X7R	Cap= 10.0 nF ESR= 1.739 Ohm VDC= 50.0 V IRMS= 411.0 mA	1	$0.01	0805 7mm2
8.	D1	Diodes Inc.	B340-13-F	VF@Io= 500.0 mV VRRM= 40.0 V	1	$0.11	SMC 83mm2
9.	L1	Bourns	SRR1260-150M	L= 15.0 µH DCR= 27.0 mOhm	1	$0.41	SRR1260 210mm2

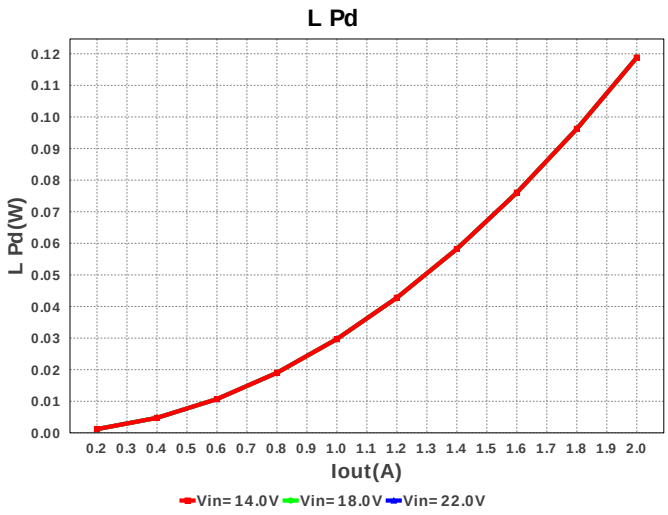
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
10.	Rcomp	Panasonic	ERJ-6ENF2002V Series= 225	Res= 20.0 kOhm Power= 125.0 mW Tolerance= 1.0%	1	$0.01	0805 7mm2
11.	Rfb1	Panasonic	ERJ-6ENF1001V Series= 225	Res= 1,000 Ohm Power= 125.0 mW Tolerance= 1.0%	1	$0.01	0805 7mm2
12.	Rfb2	Panasonic	ERJ-6ENF1691V Series= 225	Res= 1.69 kOhm Power= 125.0 mW Tolerance= 1.0%	1	$0.01	0805 7mm2
13.	Rt	Panasonic	ERJ-6ENF8661V Series= 225	Res= 8.66 kOhm Power= 125.0 mW Tolerance= 1.0%	1	$0.01	0805 7mm2
14.	U1	Texas Instruments	LM25576MHX/NOPB	Switcher	1	$2.00	MXA20A 71mm2

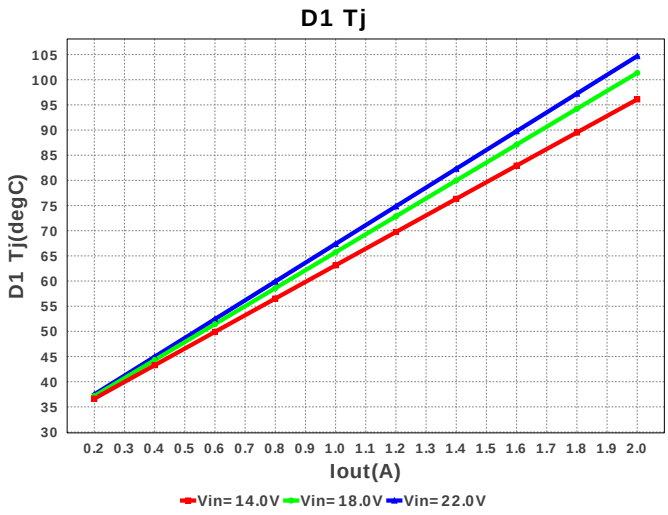


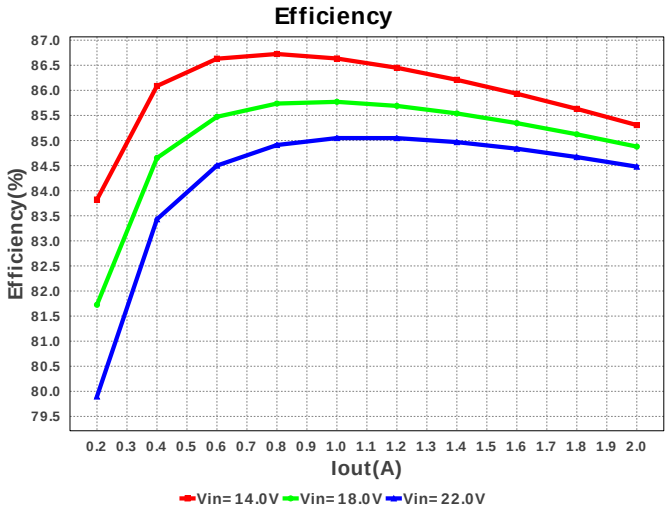


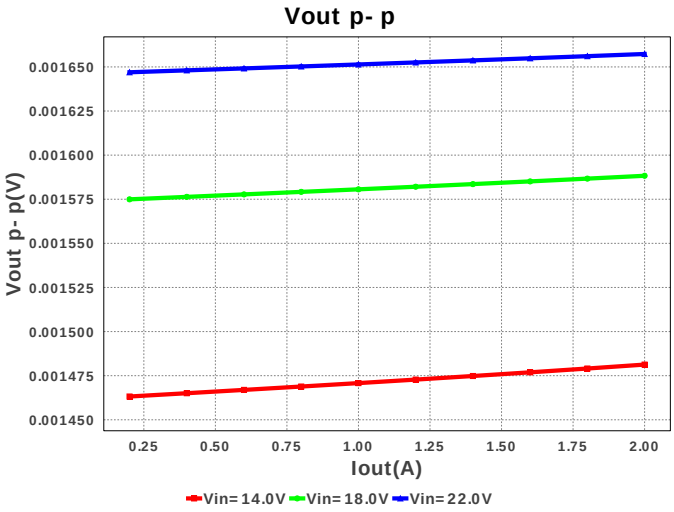


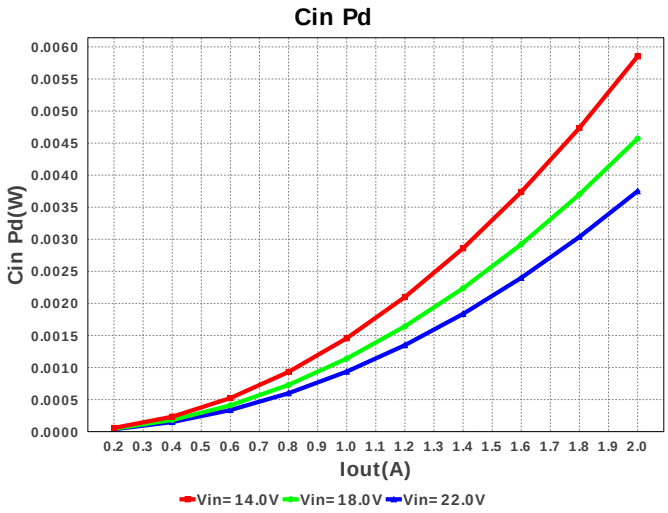


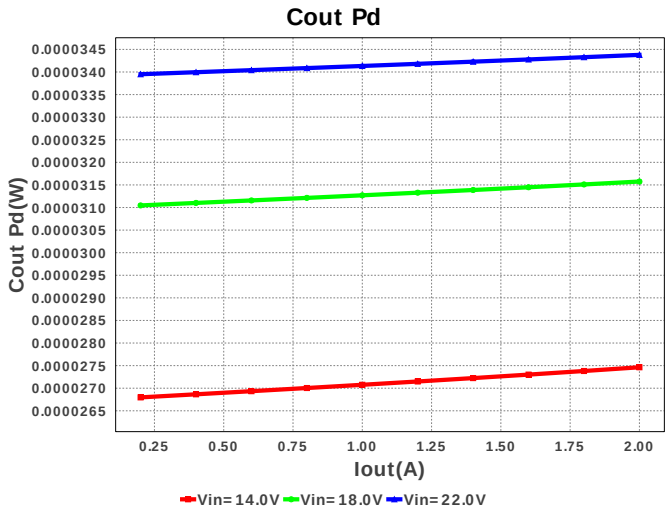


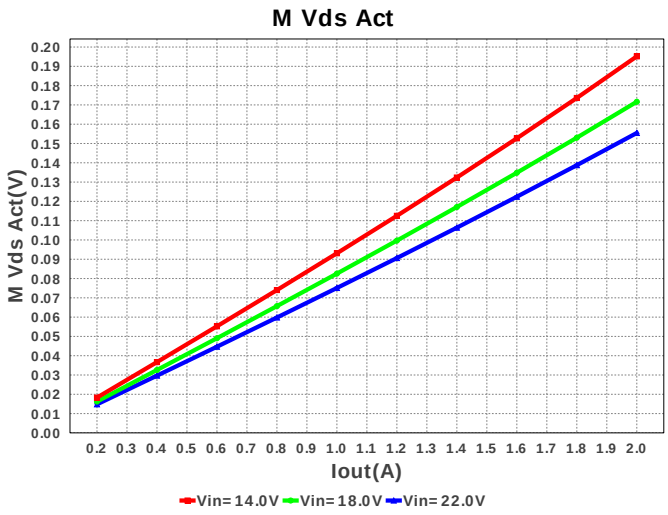


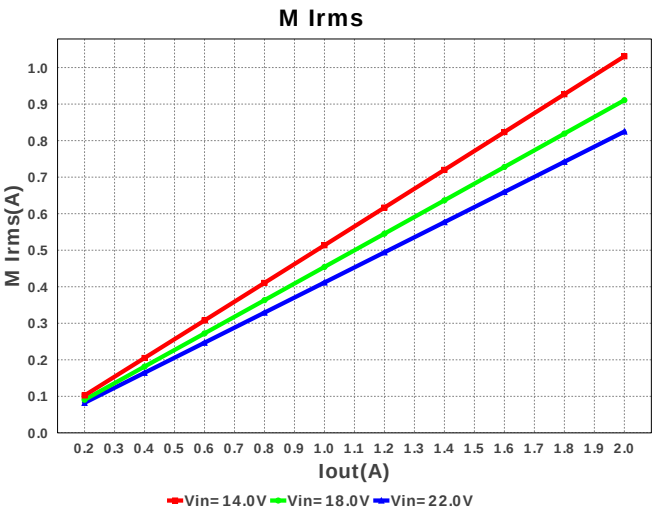


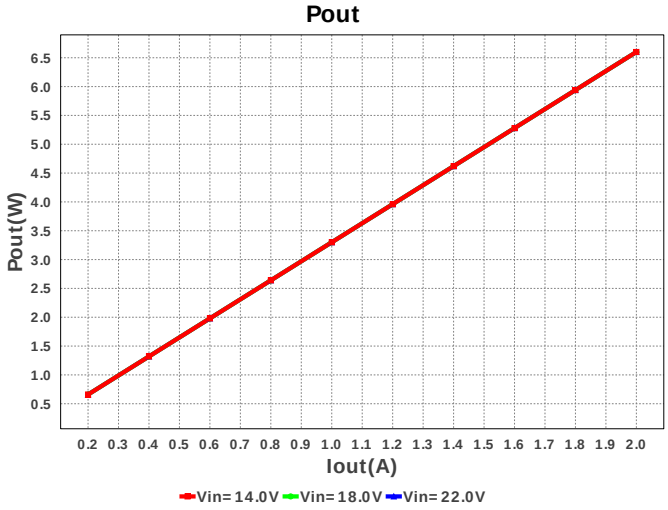


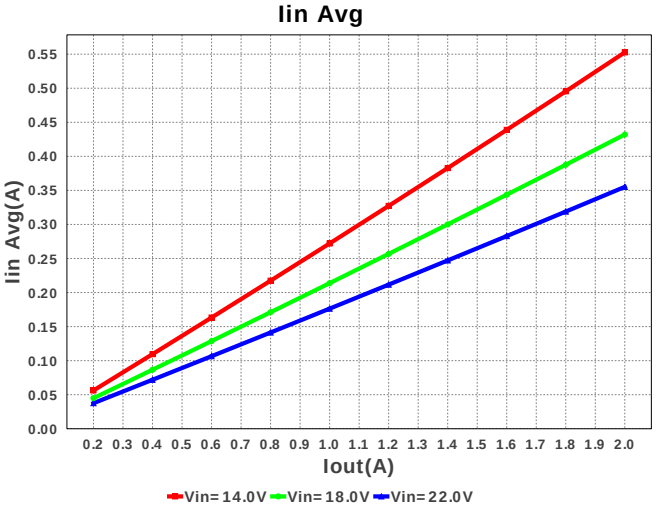


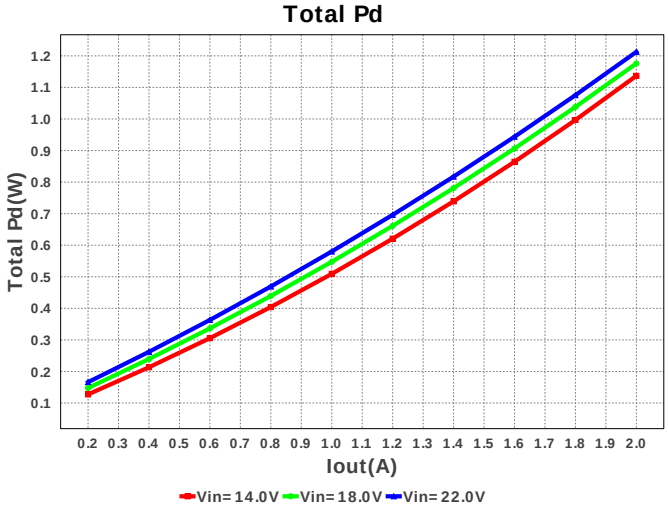


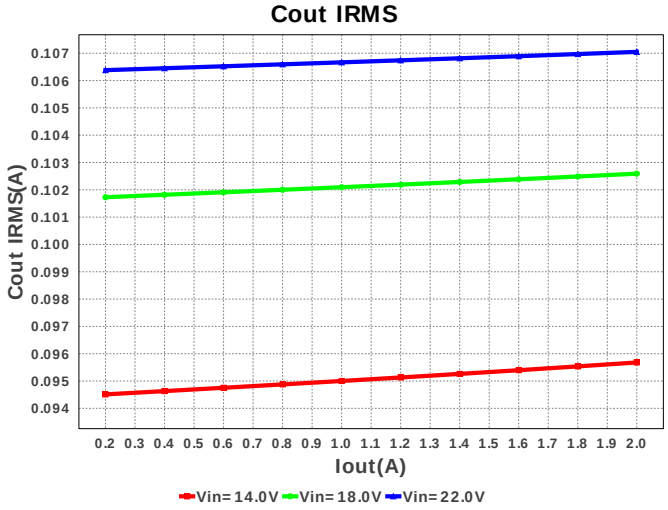


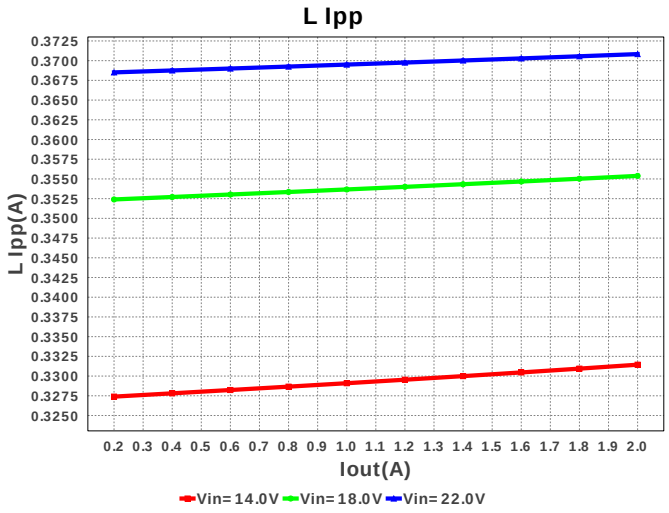


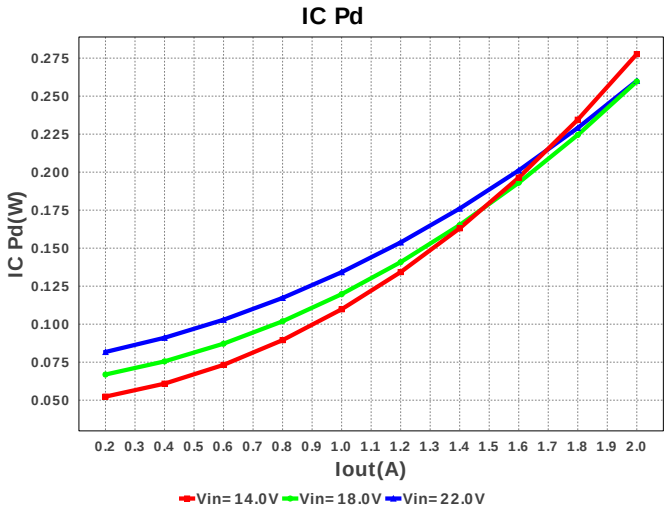


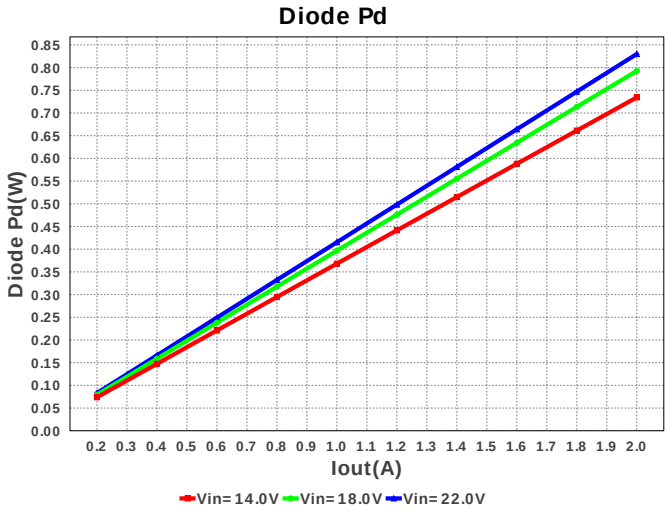


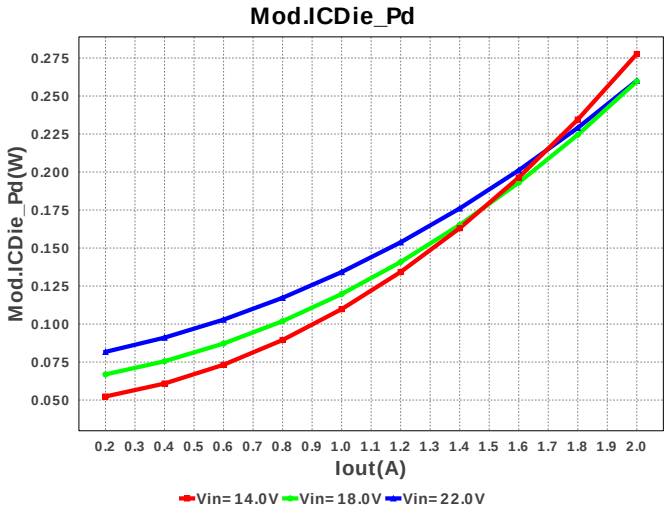












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	707.142 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	107.05 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	2.184 A	Current	Peak switch current in IC
4.	Iin Avg	355.12 mA	Current	Average input current
5.	L Ipp	370.832 mA	Current	Peak-to-peak inductor ripple current
6.	M Irms	824.776 mA	Current	MOSFET RMS current
7.	BOM Count	16	General	Total Design BOM count
8.	FootPrint	457.0 mm2	General	Total Foot Print Area of BOM components
9.	Frequency	571.723 kHz	General	Switching frequency
10.	IC Tolerance	18.0 mV	General	IC Feedback Tolerance
11.	M Vds Act	155.457 mV	General	Voltage drop across the MosFET
12.	Pout	6.6 W	General	Total output power
13.	Total BOM	$2.8	General	Total BOM Cost
14.	D1 Tj	104.694 degC	Op_Point	D1 junction temperature
15.	Vout OP	3.3 V	Op_Point	Operational Output Voltage
16.	Duty Cycle	17.006 %	Op_point	Duty cycle
17.	Efficiency	84.479 %	Op_point	Steady state efficiency
18.	IC Tj	40.403 degC	Op_point	IC junction temperature
19.	ICThetaJA	40.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
20.	IOUT_OP	2.0 A	Op_point	Iout operating point
21.	VIN_OP	22.0 V	Op_point	Vin operating point
22.	Vout p-p	1.657 mV	Op_point	Peak-to-peak output ripple voltage
23.	Cin Pd	3.75 mW	Power	Input capacitor power dissipation
24.	Cout Pd	34.379 µW	Power	Output capacitor power dissipation
25.	Diode Pd	829.936 mW	Power	Diode power dissipation
26.	IC Pd	260.074 mW	Power	IC power dissipation
27.	L Pd	118.8 mW	Power	Inductor power dissipation
28.	Total Pd	1.213 W	Power	Total Power Dissipation

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	LM25576	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	ta	30.0 degC	Ambient temperature

Design Assistance

1. LM25576 Product Folder : http://www.ti.com/product/lm25576 : contains the data sheet and other resources.