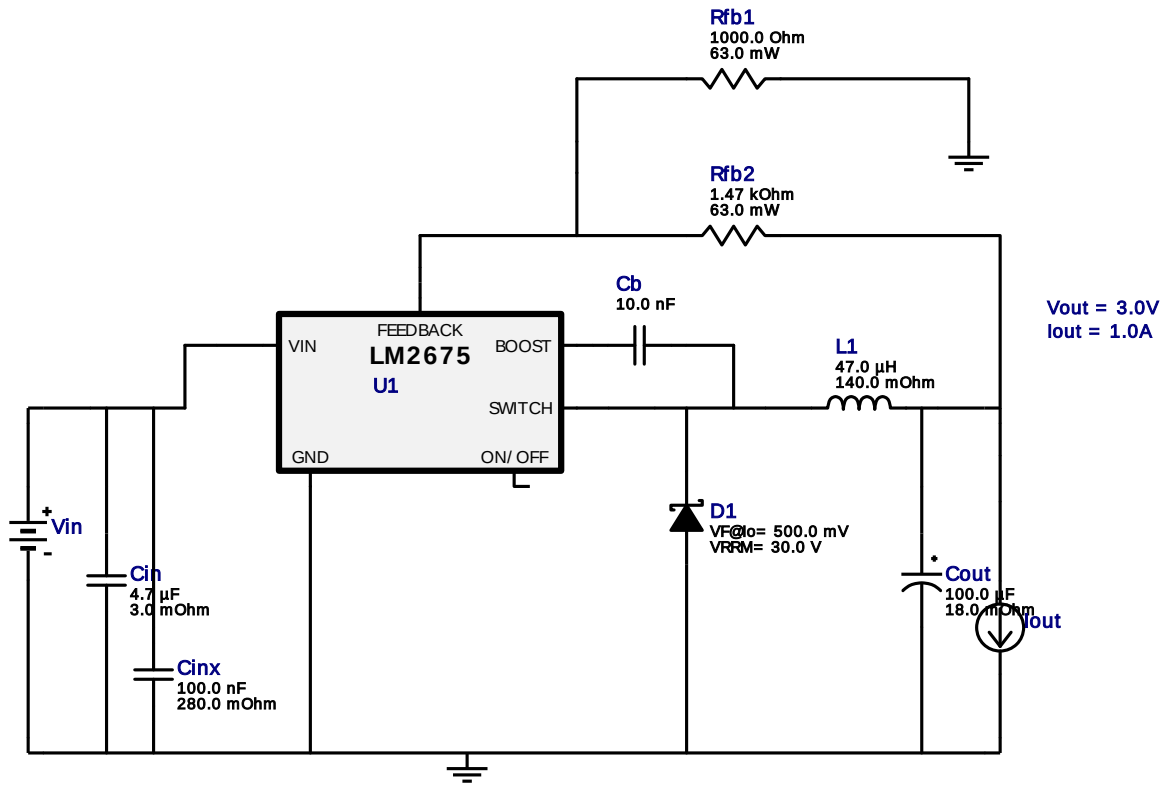
TEXAS INSTRUMENTS

WEBENCH® Design Report

VinMin = 10.0V
VinMax = 19.0V
Vout = 3.0V
Iout = 1.0A

Device = LM2675MX-ADJ/NOPB
Topology = Buck
Created = 7/19/16 6:09:48 AM
BOM Cost = $2.55
BOM Count = 9
Total Pd = 0.6W

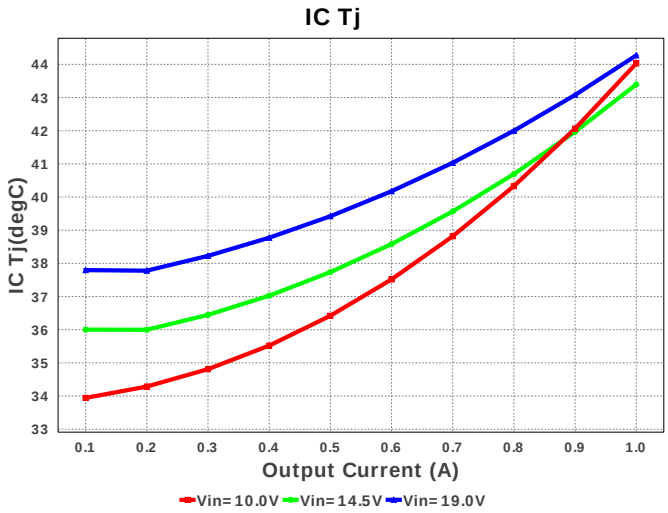
Design : 4728729/38 LM2675MX-ADJ/NOPB
LM2675MX-ADJ/NOPB 10.0V-19.0V to 3.00V @ 1.0A

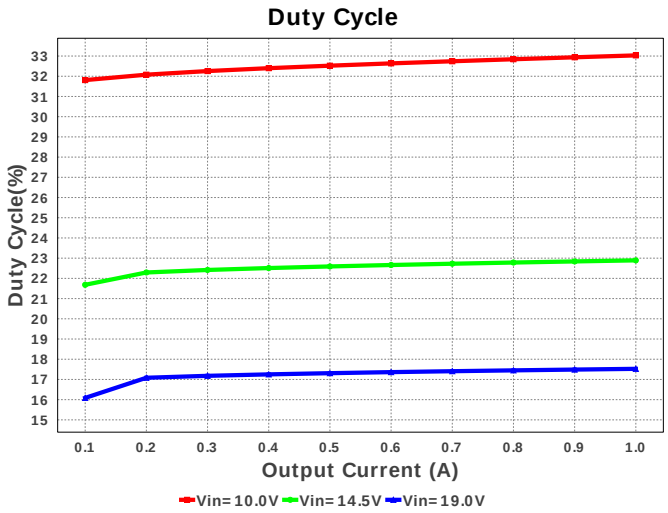


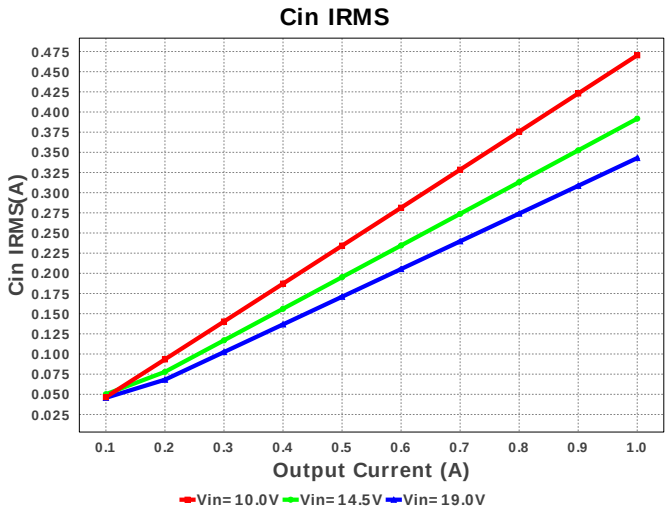
Electrical BOM

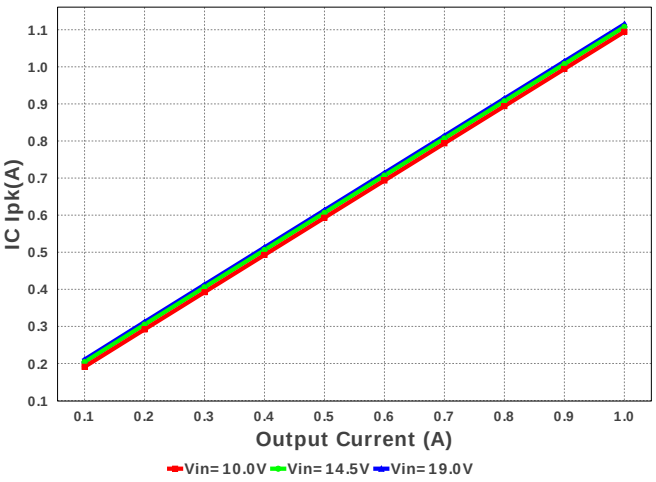
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cb	MuRata	GRM216R71H103KA01D Series= X7R	Cap= 10.0 nF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 7 mm²
2.	Cin	MuRata	GRM31CR71H475KA12L Series= X7R	Cap= 4.7 uF ESR= 3.0 mOhm VDC= 50.0 V IRMS= 4.98 A	1	$0.07	1206 11 mm²
3.	Cinx	AVX	08053C104KAT2A Series= X7R	Cap= 100.0 nF ESR= 280.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	$0.01	0805 7 mm²
4.	Cout	Kemet	T520B107M006ATE018 Series= T520	Cap= 100.0 uF ESR= 18.0 mOhm VDC= 6.3 V IRMS= 2.7 A	1	$0.56	3528-21 17 mm²
5.	D1	Diodes Inc.	B230A-13-F	VF@Io= 500.0 mV VRRM= 30.0 V	1	$0.09	SMA 37 mm²
6.	L1	NIC Components	NPI31W470MTRF	L= 47.0 µH DCR= 140.0 mOhm	1	$0.18	IND_NPI31W 172 mm²

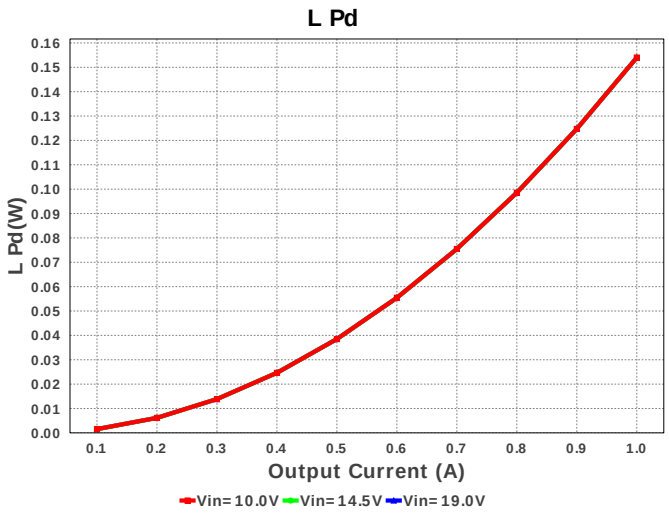
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
7.	Rfb1	Vishay-Dale	CRCW04021K00FKED Series= CRCW..e3	Res= 1000.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
8.	Rfb2	Vishay-Dale	CRCW04021K47FKED Series= CRCW..e3	Res= 1.47 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
9.	U1	Texas Instruments	LM2675MX-ADJ/NOPB	Switcher	1	$1.60	M08A 55 mm^2

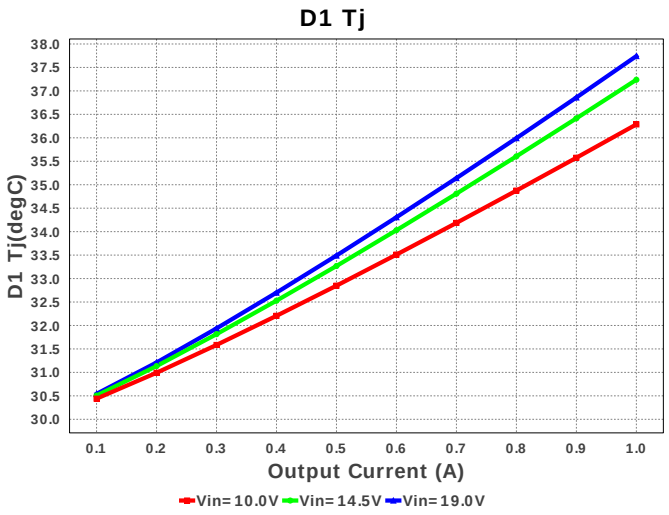


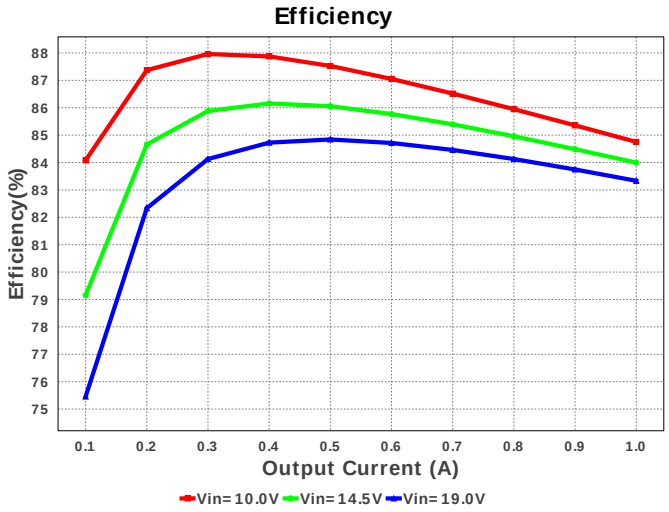


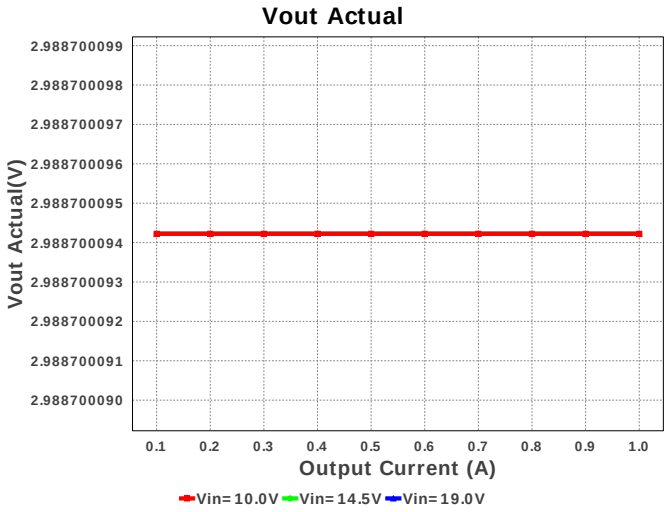


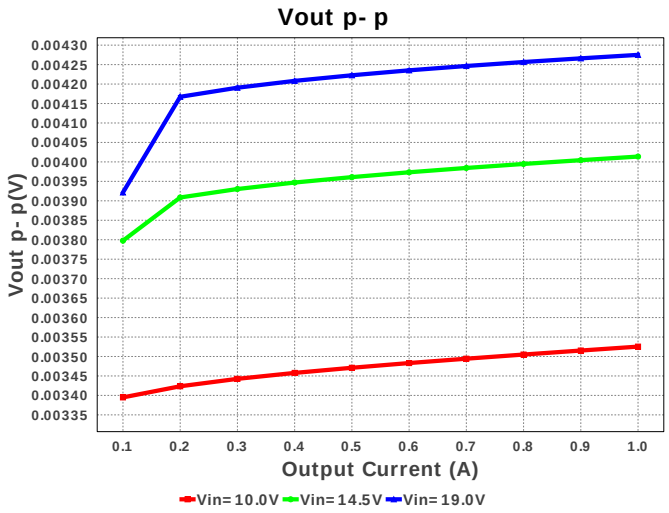


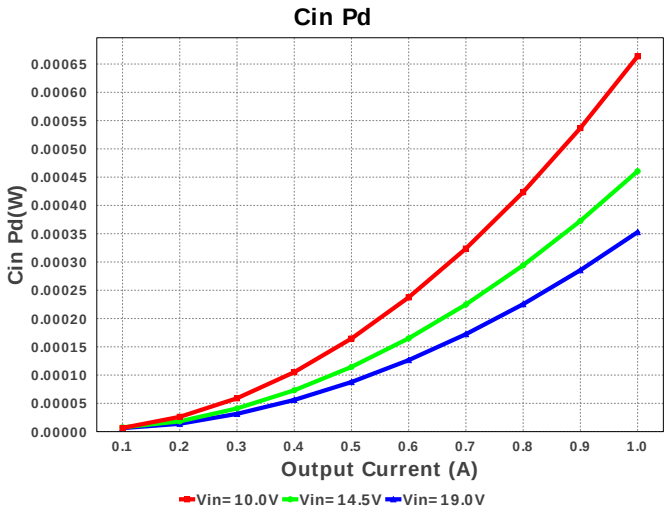


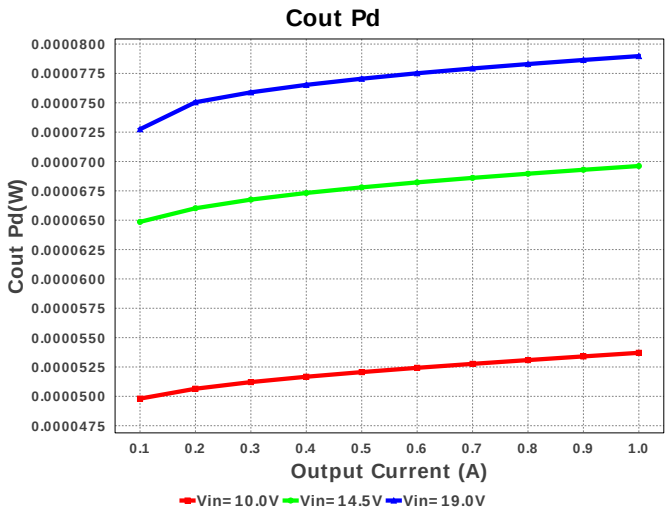


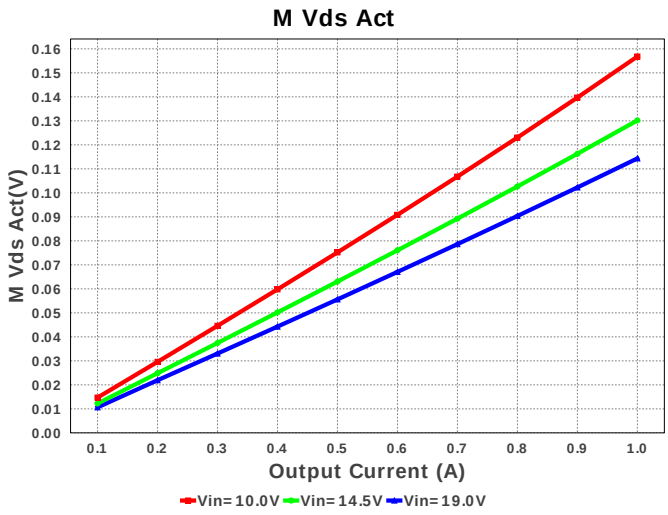


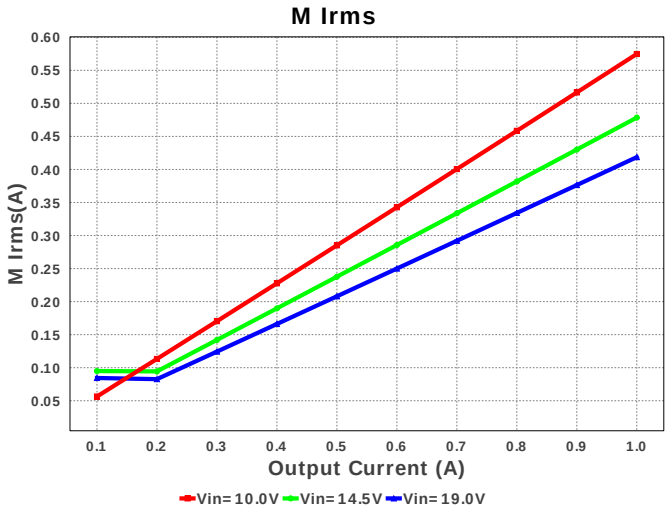


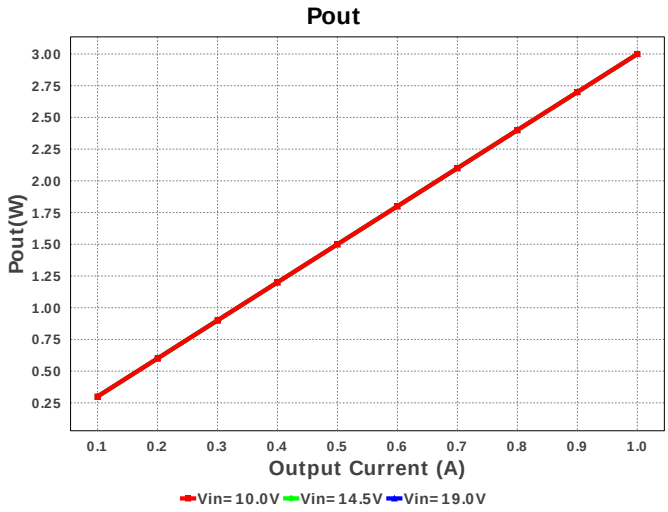


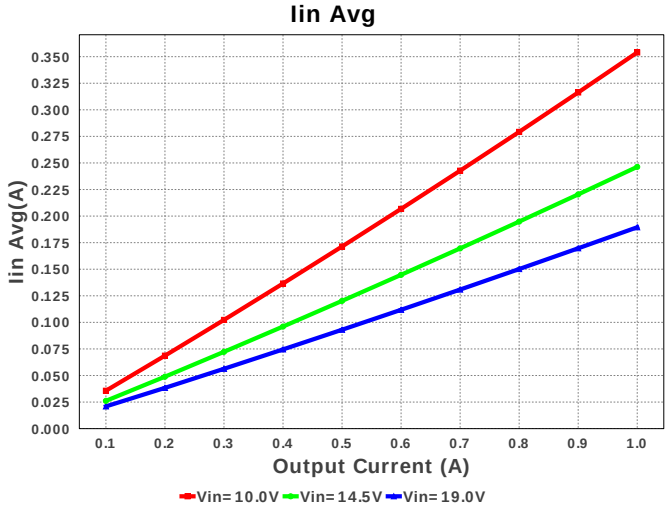


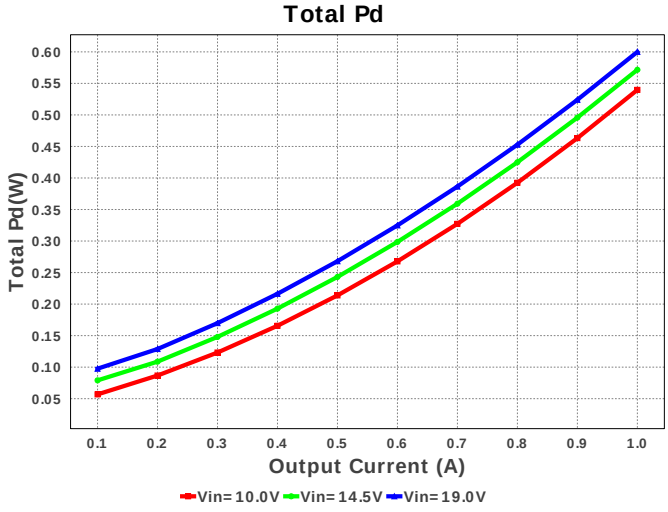


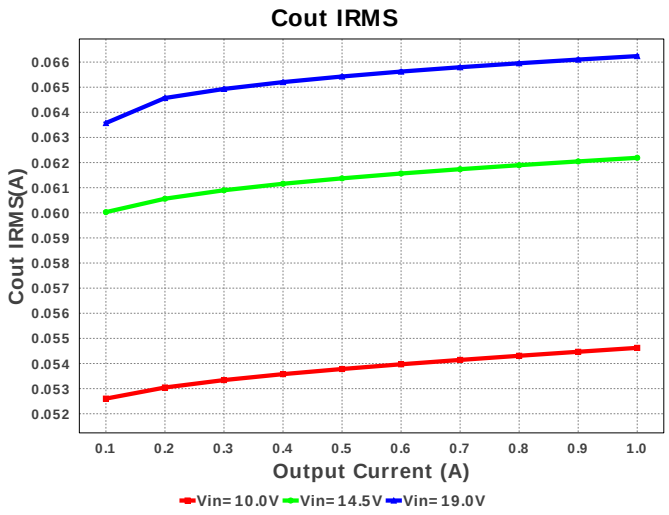


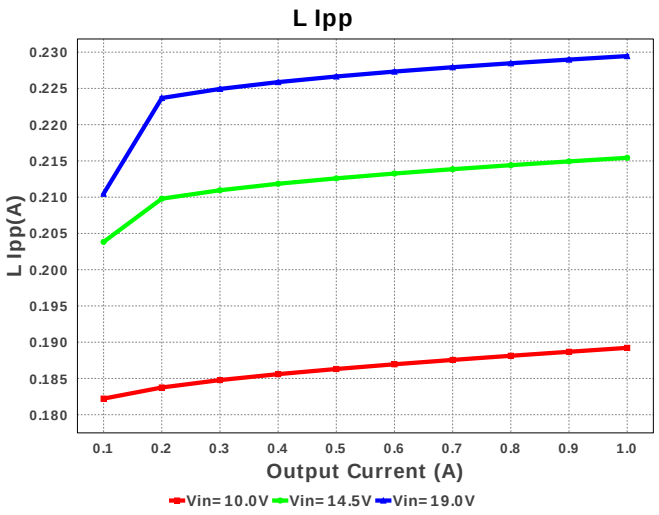


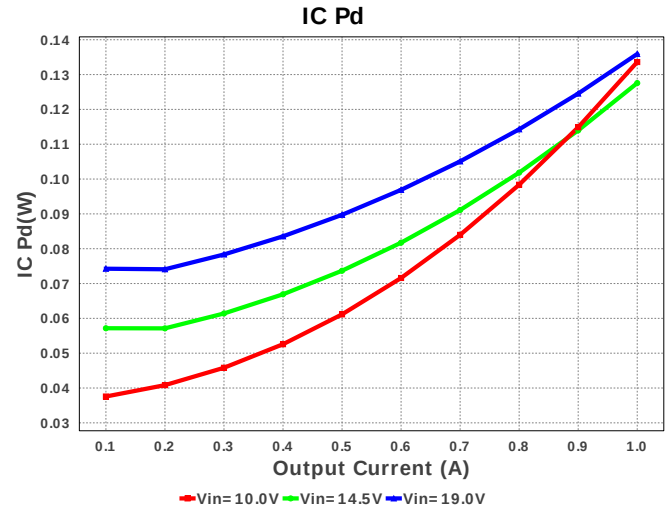


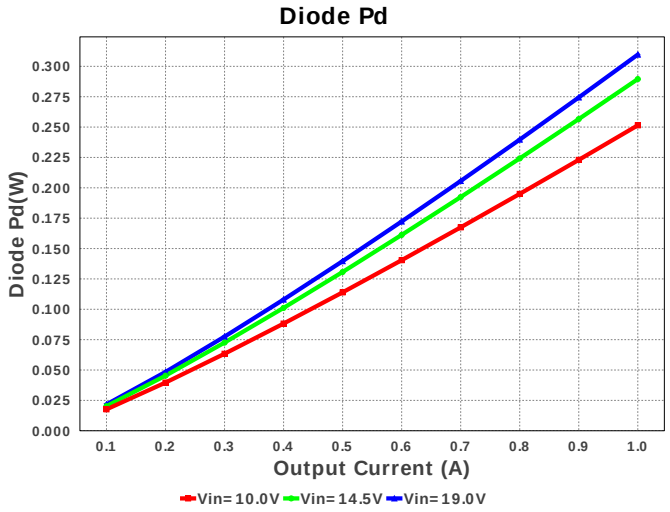












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	342.927 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	66.239 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	1.115 A	Current	Peak switch current in IC
4.	Iin Avg	189.47 mA	Current	Average input current
5.	L Ipp	229.46 mA	Current	Peak-to-peak inductor ripple current
6.	M Irms	418.626 mA	Current	MOSFET RMS current
7.	BOM Count	9	General	Total Design BOM count
8.	FootPrint	313.0 mm^2	General	Total Foot Print Area of BOM components
9.	Frequency	260.0 kHz	General	Switching frequency
10.	IC Tolerance	18.0 mV	General	IC Feedback Tolerance
11.	M Vds Act	114.337 mV	General	Voltage drop across the MosFET
12.	Pout	3.0 W	General	Total output power
13.	Total BOM	$2.55	General	Total BOM Cost
14.	D1 Tj	37.742 degC	Op_Point	D1 junction temperature
15.	Vout Actual	2.989 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
16.	Vout OP	3.0 V	Op_Point	Operational Output Voltage
17.	Cross Freq	28.07 kHz	Op_point	Bode plot crossover frequency
18.	Duty Cycle	17.525 %	Op_point	Duty cycle
19.	Efficiency	83.333 %	Op_point	Steady state efficiency
20.	IC Tj	44.271 degC	Op_point	IC junction temperature
21.	ICThetaJA	105.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
22.	IOUT_OP	1.0 A	Op_point	Iout operating point
23.	Phase Marg	49.321 deg	Op_point	Bode Plot Phase Margin
24.	VIN_OP	19.0 V	Op_point	Vin operating point
25.	Vout p-p	4.275 mV	Op_point	Peak-to-peak output ripple voltage
26.	Cin Pd	352.796 µW	Power	Input capacitor power dissipation
27.	Cout Pd	78.976 µW	Power	Output capacitor power dissipation
28.	Diode Pd	309.67 mW	Power	Diode power dissipation
29.	IC Pd	135.911 mW	Power	IC power dissipation
30.	L Pd	154.0 mW	Power	Inductor power dissipation
31.	Total Pd	600.0 mW	Power	Total Power Dissipation

#	Name	Value	Category	Description
32.	Vout Tolerance	2.708 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	1.0	Maximum Output Current
2.	VinMax	19.0	Maximum input voltage
3.	VinMin	10.0	Minimum input voltage
4.	Vout	3.0	Output Voltage
5.	base_pn	LM2675	Texas Instruments Base Part Number
6.	source	DC	Input Source Type
7.	ta	30.0	Ambient temperature

Design Assistance

1. LM2675 Product Folder : http://www.ti.com/product/LM2675 : contains the data sheet and other resources.