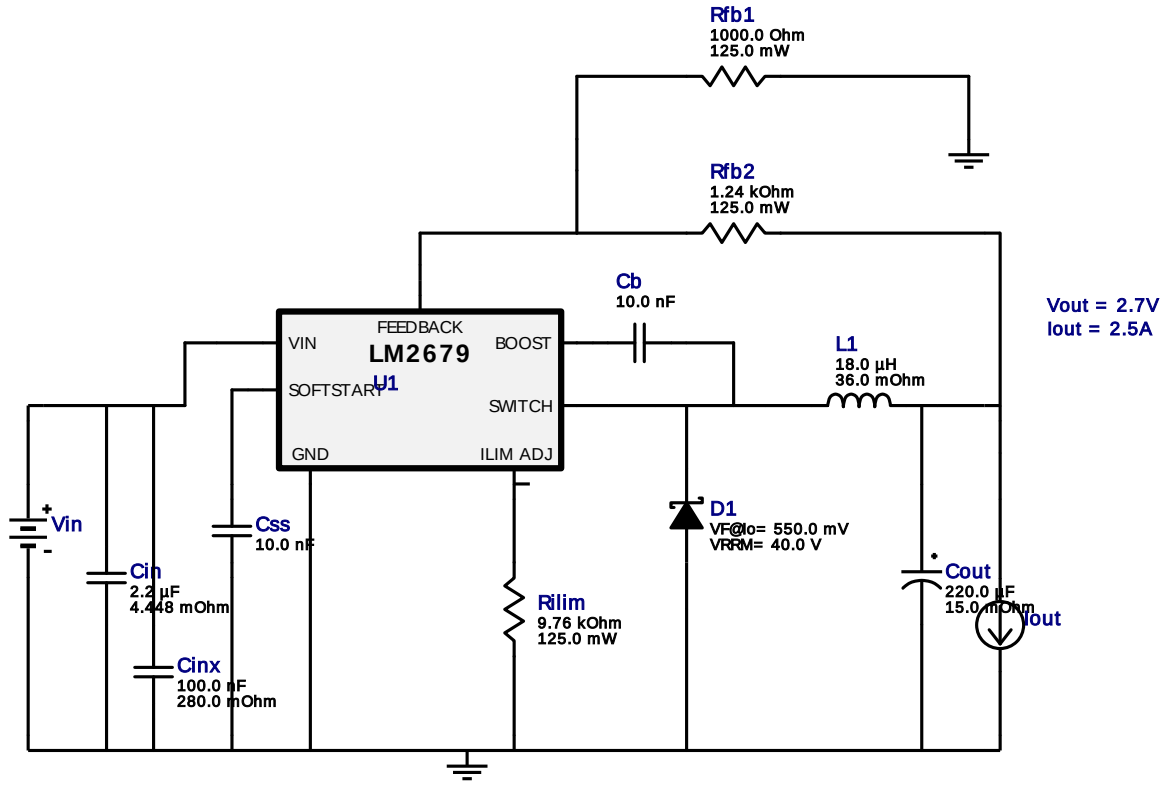
WEBENCH® Design Report

VinMin = 16.0V
VinMax = 20.0V
Vout = 2.7V
Iout = 2.5A

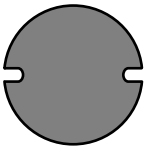
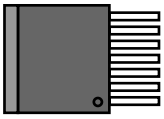
Device = LM2679SX-ADJ/NOPB
Topology = Buck
Created = 8/9/16 2:15:58 AM
BOM Cost = $3.08
BOM Count = 11
Total Pd = 1.39W

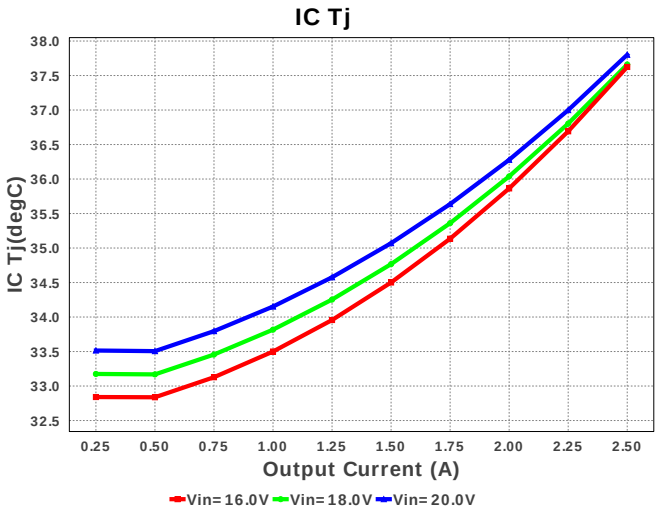
Design : 4763576/1 LM2679SX-ADJ/NOPB
LM2679SX-ADJ/NOPB 16.0V-20.0V to 2.70V @ 2.5A

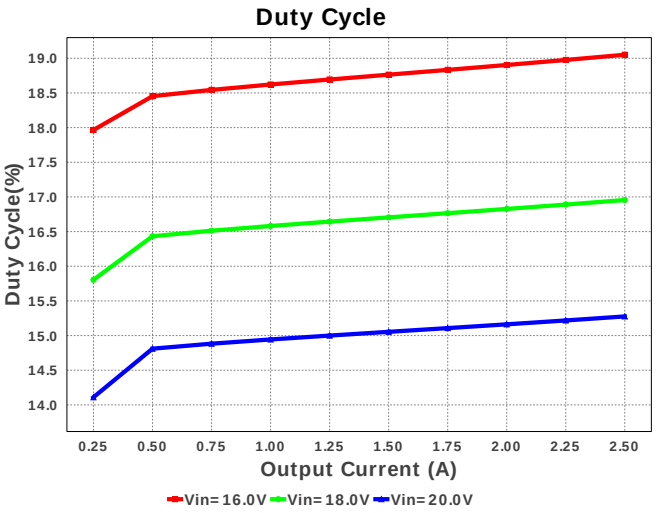


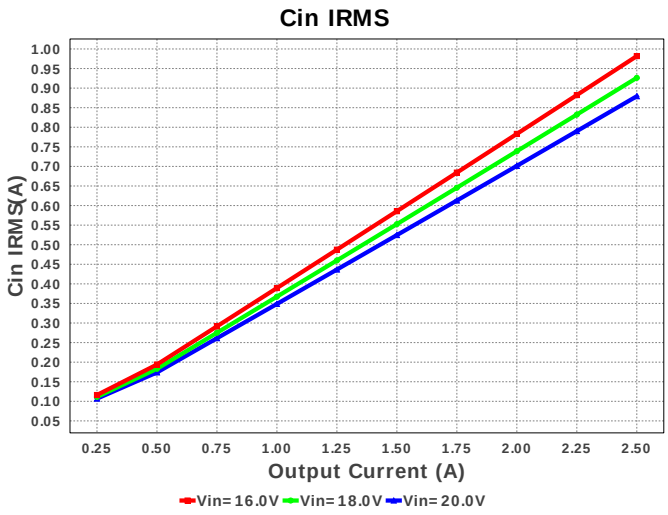
Electrical BOM

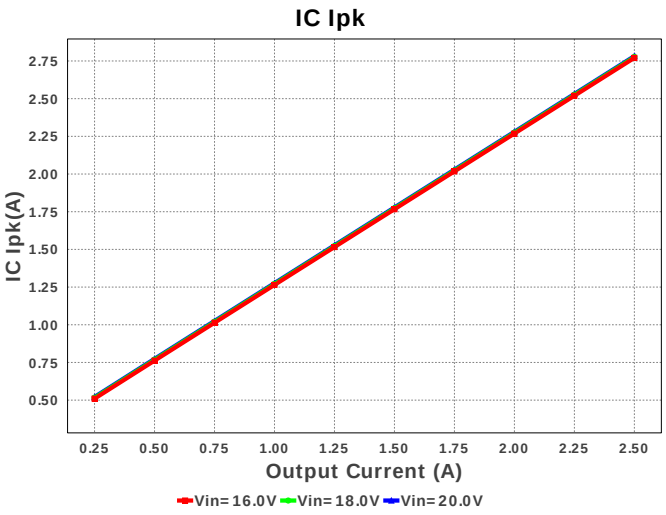
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cb	MuRata	GRM216R71H103KA01D Series= X7R	Cap= 10.0 nF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 7 mm²
2.	Cin	MuRata	GRM31CR71H225KA88L Series= X7R	Cap= 2.2 uF ESR= 4.448 mOhm VDC= 50.0 V IRMS= 2.2252 A	1	$0.05	1206_190 11 mm²
3.	Cinx	AVX	08053C104KAT2A 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	Panasonic	6SVPE220MW Series= SVPE	Cap= 220.0 uF ESR= 15.0 mOhm VDC= 6.3 V IRMS= 3.15 A	1	$0.20	CAPSMT_62_E61 53 mm²
5.	Css	MuRata	GRM216R71H103KA01D Series= X7R	Cap= 10.0 nF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 7 mm²
6.	D1	Diodes Inc.	B540C-13-F	VF@Io= 550.0 mV VRRM= 40.0 V	1	$0.17	SMC 83 mm²

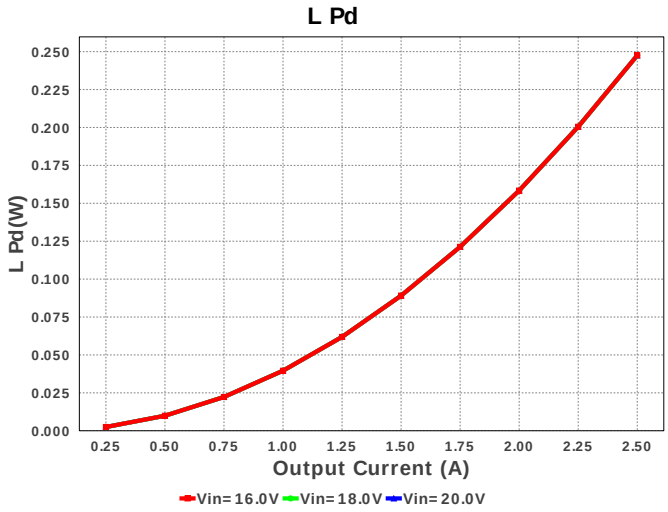
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
7.	L1	Bourns	SDR1307-180ML	L= 18.0 µH DCR= 36.0 mOhm	1	$0.35	 SDR1307 227 mm²
8.	Rfb1	Panasonic	ERJ-6ENF1001V Series= ERJ-6E	Res= 1000.0 Ohm Power= 125.0 mW Tolerance= 1.0%	1	$0.01	 0805 7 mm²
9.	Rfb2	Panasonic	ERJ-6ENF1241V Series= ERJ-6E	Res= 1.24 kOhm Power= 125.0 mW Tolerance= 1.0%	1	$0.01	 0805 7 mm²
10.	Rilim	Panasonic	ERJ-6ENF9761V Series= ERJ-6E	Res= 9.76 kOhm Power= 125.0 mW Tolerance= 1.0%	1	$0.01	 0805 7 mm²
11.	U1	Texas Instruments	LM2679SX-ADJ/NOPB	Switcher	1	$2.25	 TS7B 199 mm²

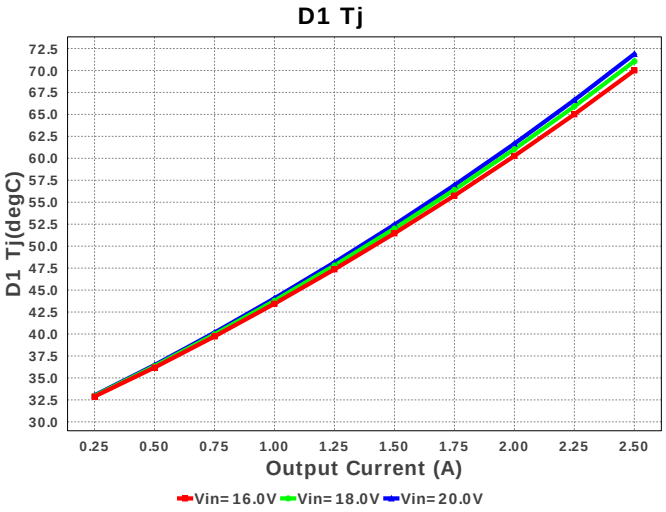


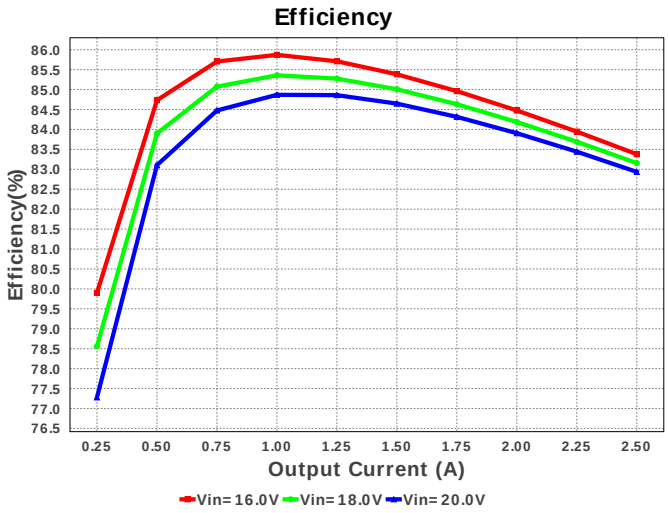


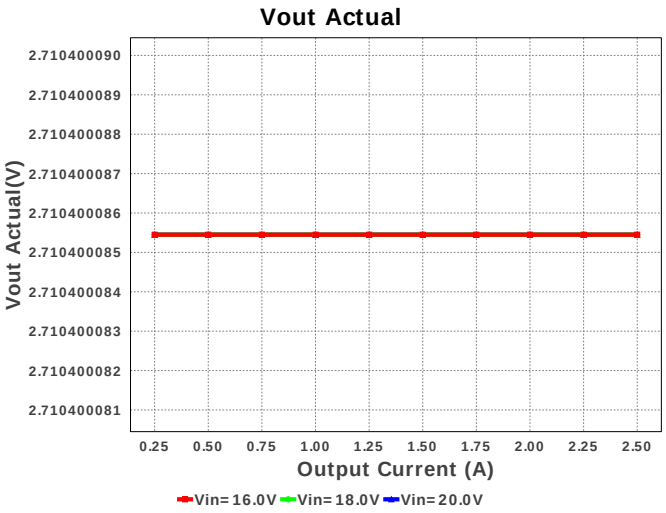


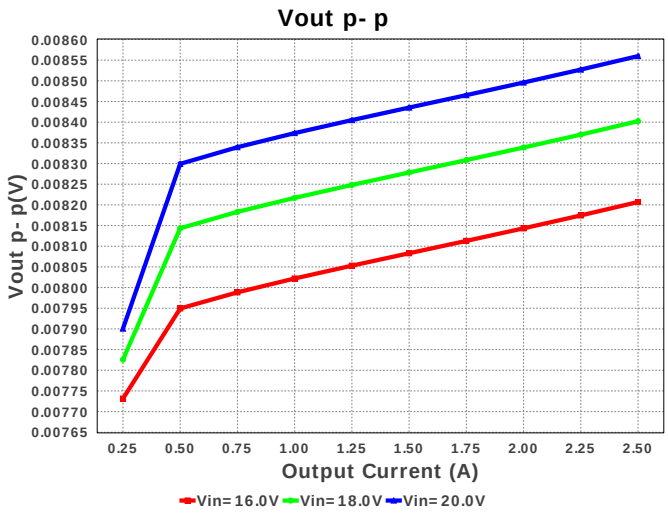


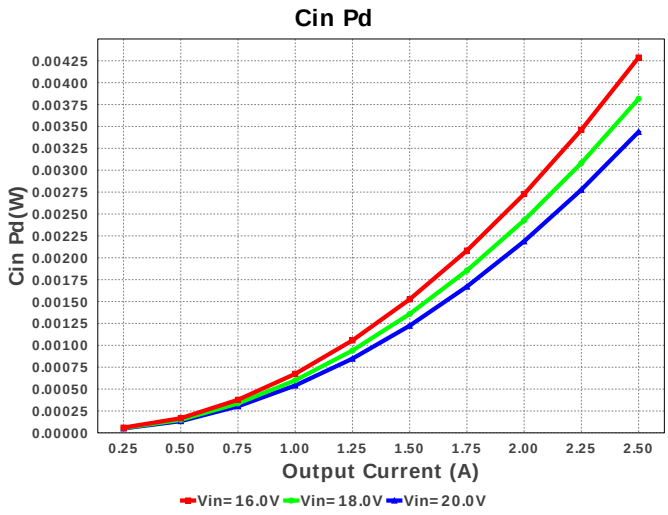


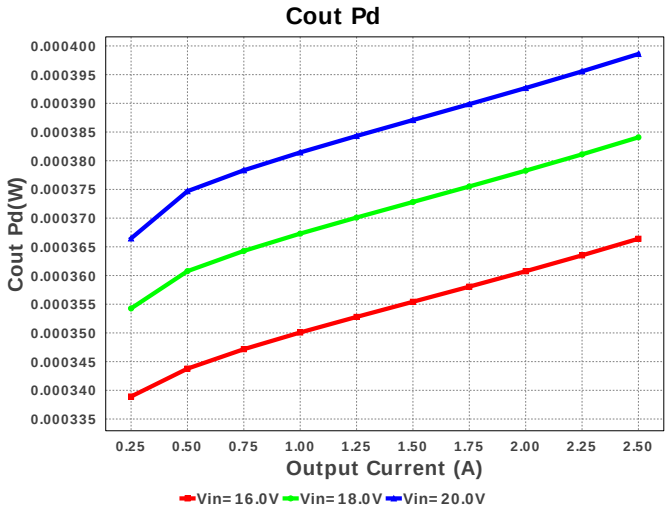


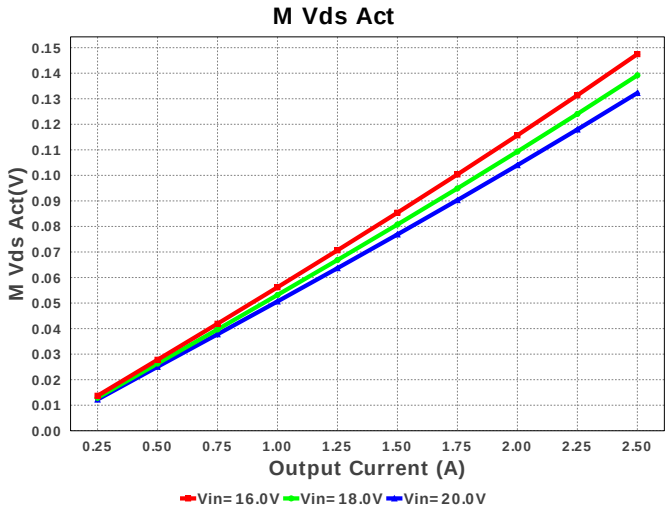


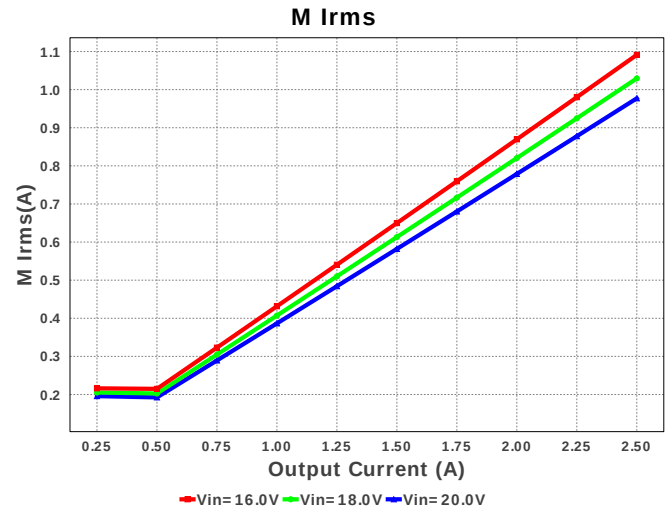


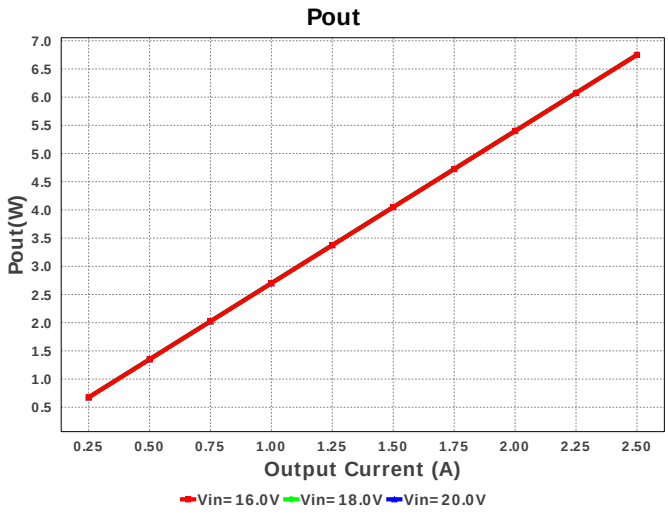


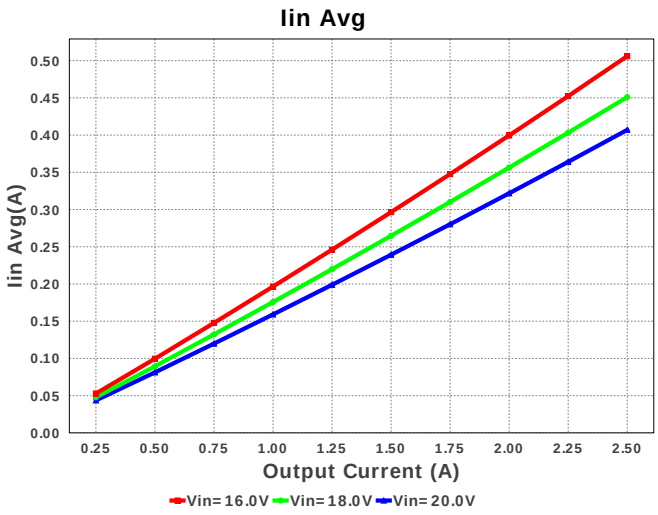


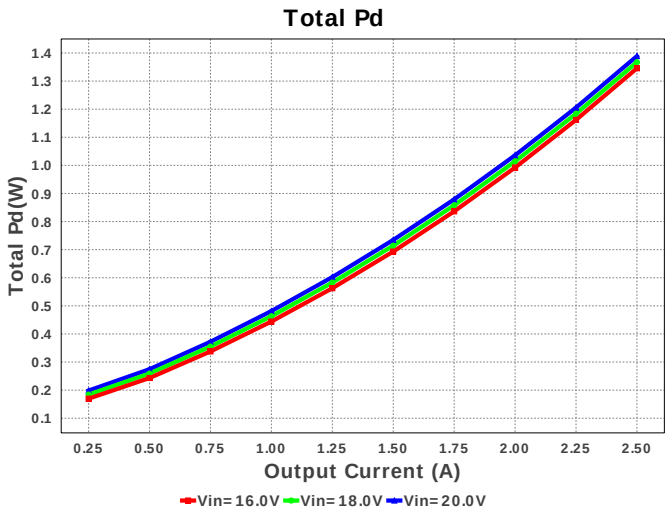


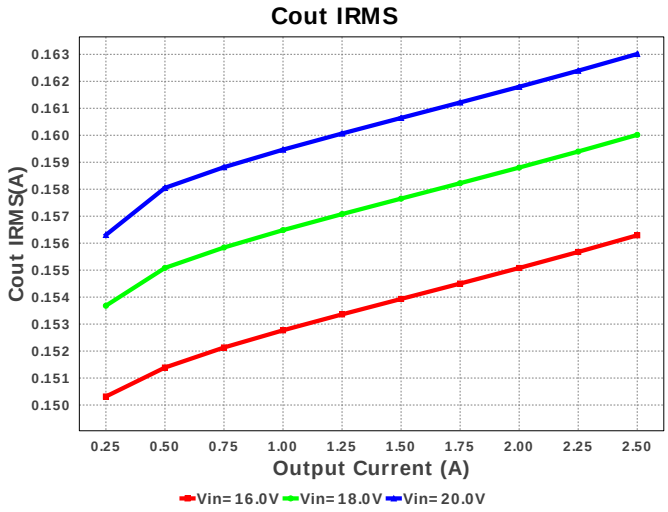


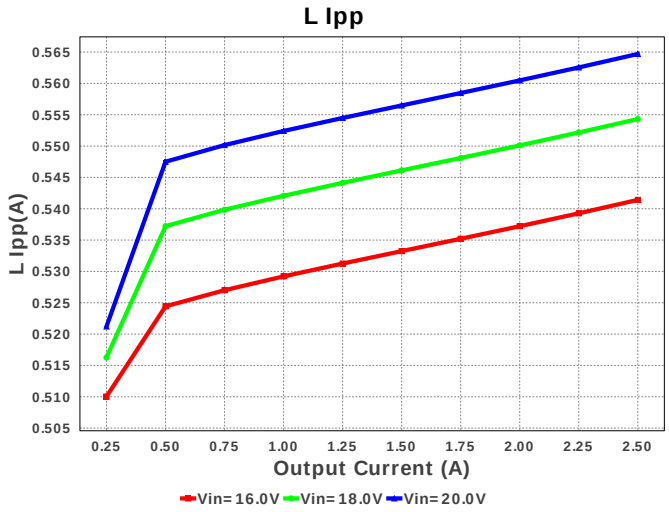


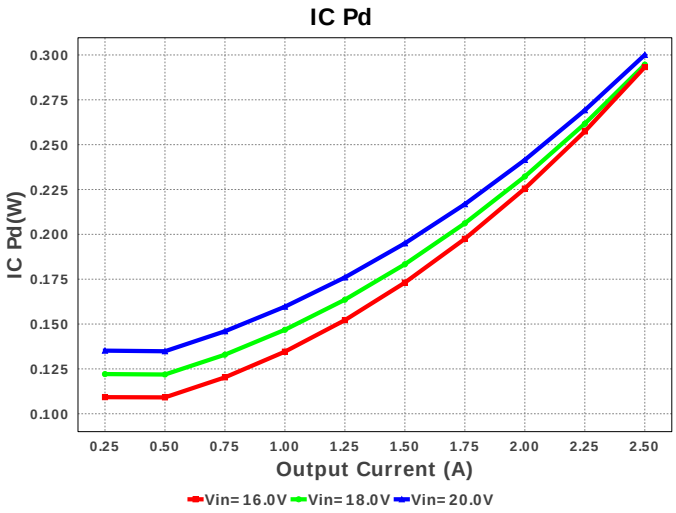


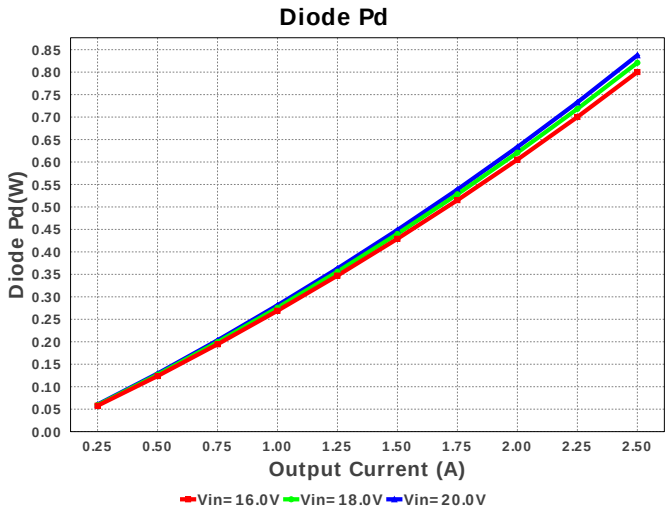












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	879.224 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	163.013 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	2.782 A	Current	Peak switch current in IC
4.	Iin Avg	406.95 mA	Current	Average input current
5.	L Ipp	564.69 mA	Current	Peak-to-peak inductor ripple current
6.	M1 Irms	977.116 mA	Current	Q Iavg
7.	BOM Count	11	General	Total Design BOM count
8.	FootPrint	613.0 mm^2	General	Total Foot Print Area of BOM components
9.	Frequency	260.0 kHz	General	Switching frequency
10.	IC Tolerance	24.0 mV	General	IC Feedback Tolerance
11.	M Vds Act	132.264 mV	General	Voltage drop across the MosFET

#	Name	Value	Category	Description
12.	Pout	6.75 W	General	Total output power
13.	Total BOM	$3.08	General	Total BOM Cost
14.	D1 Tj	71.877 degC	Op_Point	D1 junction temperature
15.	Vout Actual	2.71 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
16.	Vout OP	2.7 V	Op_Point	Operational Output Voltage
17.	Cross Freq	36.079 kHz	Op_point	Bode plot crossover frequency
18.	Duty Cycle	15.276 %	Op_point	Duty cycle
19.	Efficiency	82.935 %	Op_point	Steady state efficiency
20.	IC Tj	37.801 degC	Op_point	IC junction temperature
21.	ICThetaJA	26.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
22.	IOUT_OP	2.5 A	Op_point	Iout operating point
23.	Phase Marg	69.69 deg	Op_point	Bode Plot Phase Margin
24.	VIN_OP	20.0 V	Op_point	Vin operating point
25.	Vout p-p	8.56 mV	Op_point	Peak-to-peak output ripple voltage
26.	Cin Pd	3.438 mW	Power	Input capacitor power dissipation
27.	Cout Pd	398.598 µW	Power	Output capacitor power dissipation
28.	Diode Pd	837.535 mW	Power	Diode power dissipation
29.	IC Pd	300.047 mW	Power	IC power dissipation
30.	L Pd	247.5 mW	Power	Inductor power dissipation
31.	Total Pd	1.389 W	Power	Total Power Dissipation
32.	Vout Tolerance	3.124 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	2.5	Maximum Output Current
2.	VinMax	20.0	Maximum input voltage
3.	VinMin	16.0	Minimum input voltage
4.	Vout	2.7	Output Voltage
5.	base_pn	LM2679	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. Warning! With certain softstart capacitor values and operating conditions, the LM267X can exhibit an overshoot on the output voltage during turn on. Especially when starting up into no load or low load, the softstart function may not be effective in preventing a larger voltage overshoot on the output. With larger loads or lower input voltages during startup this effect is minimized. In particular, avoid using softstart capacitors between 0.033uF and 1uF.

2. **LM2679** Product Folder : http://www.ti.com/product/LM2679 : contains the data sheet and other resources.