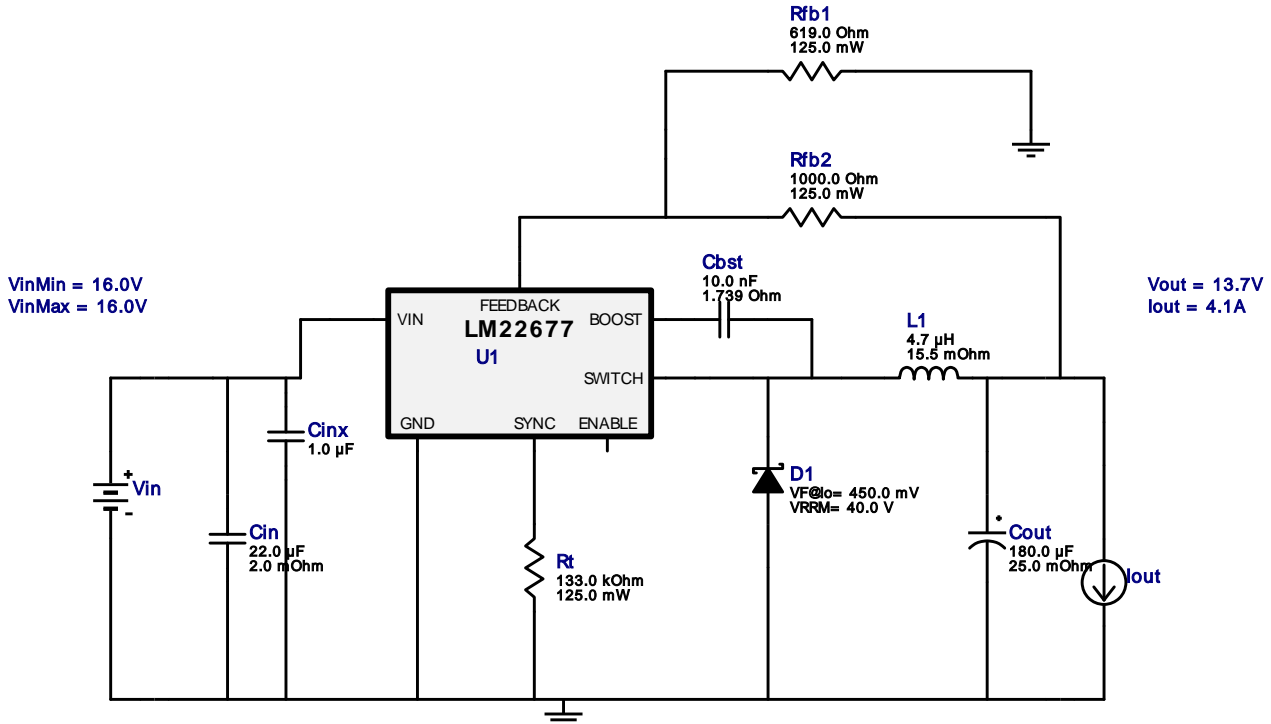










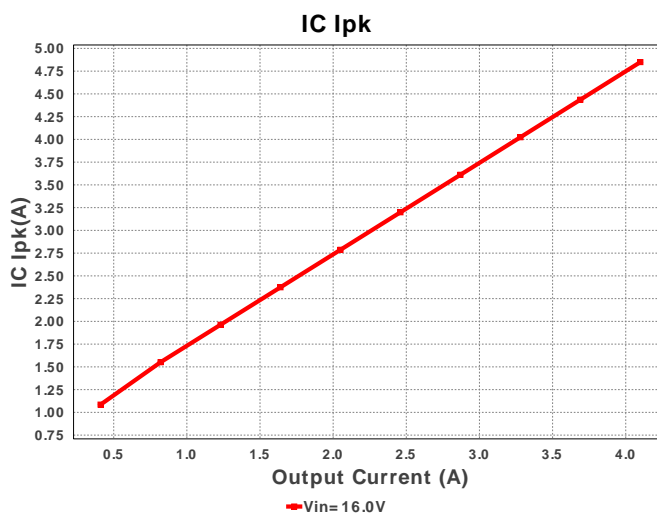
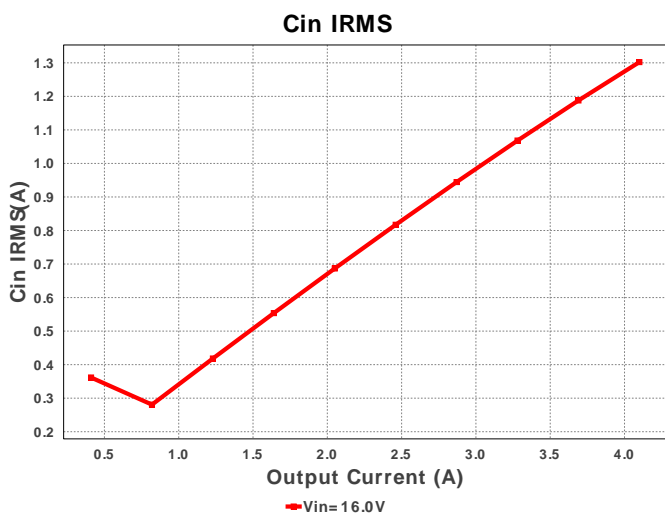
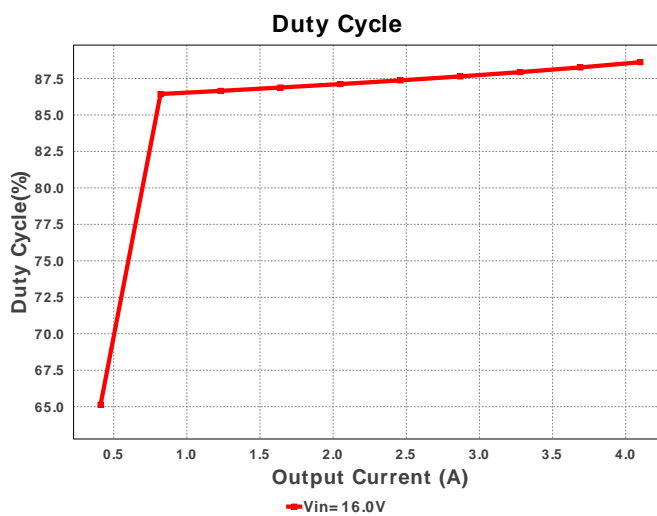
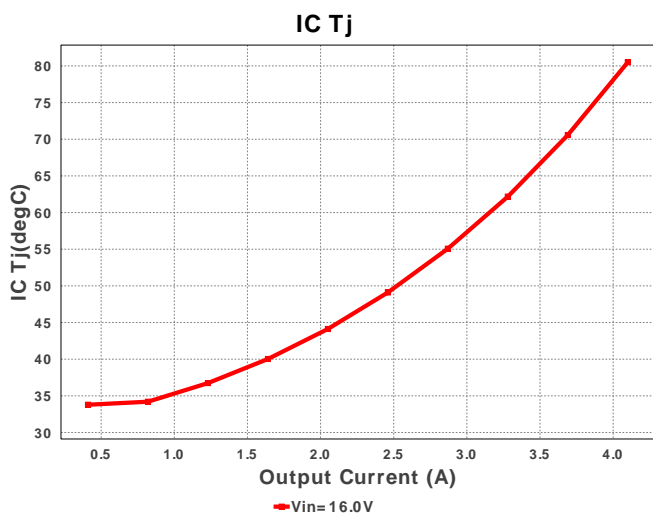


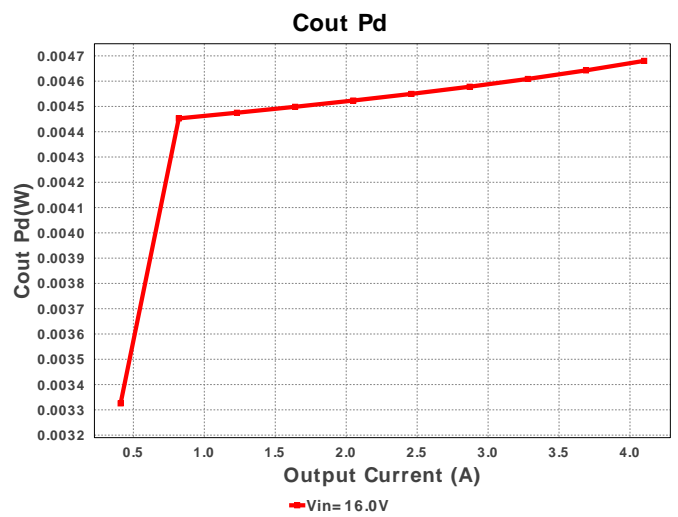
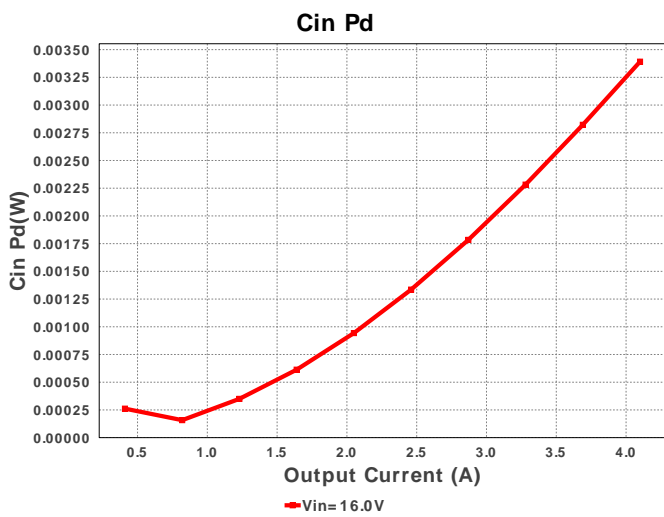
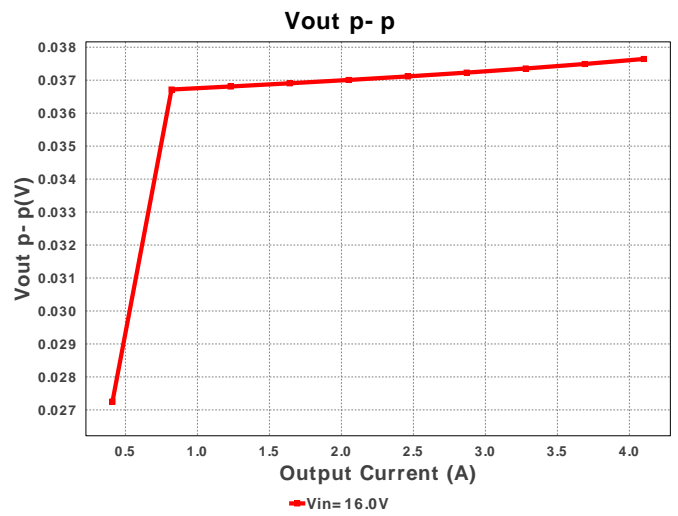
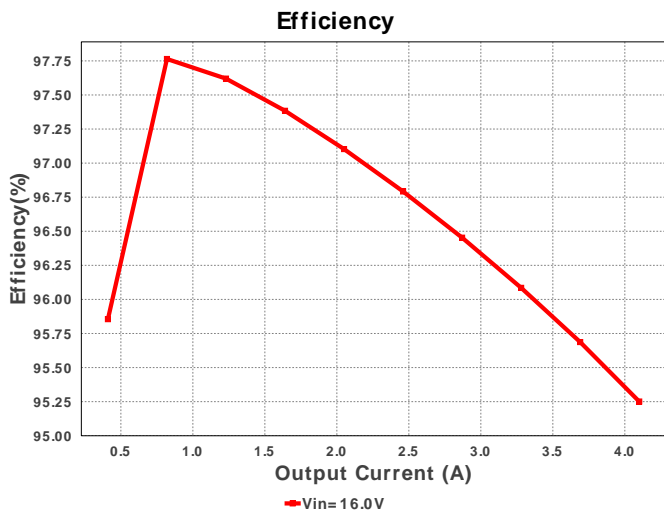
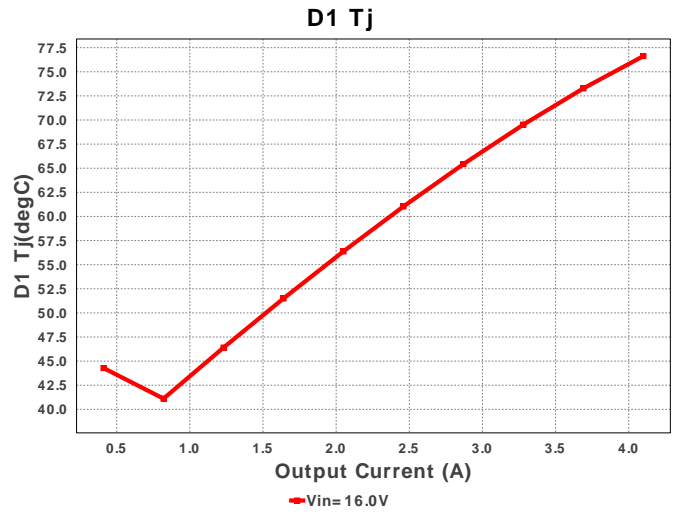
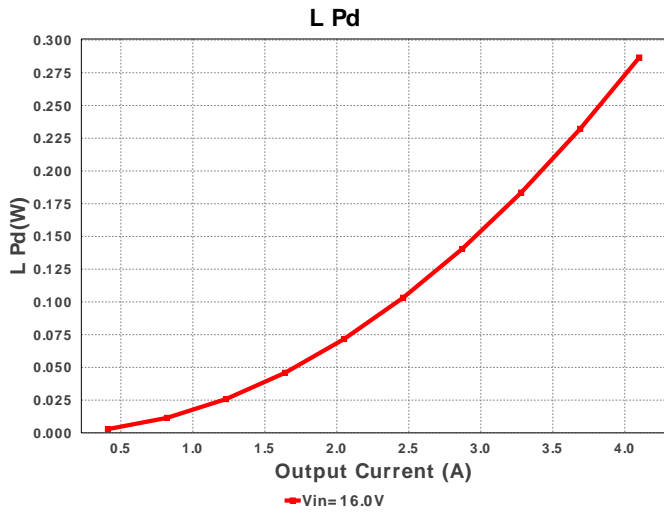
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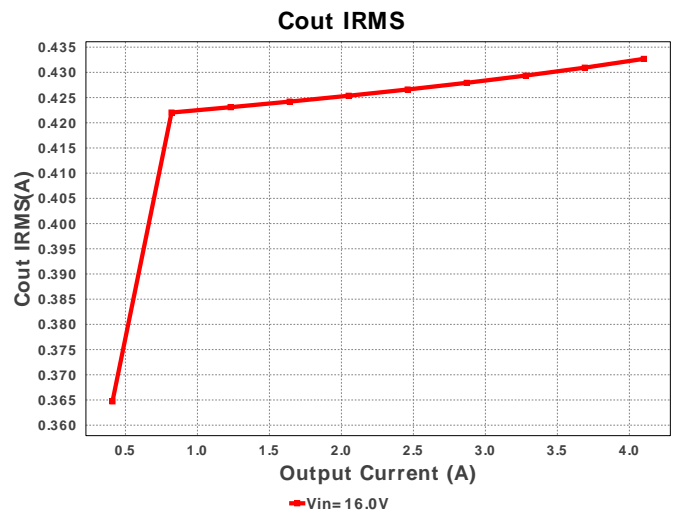
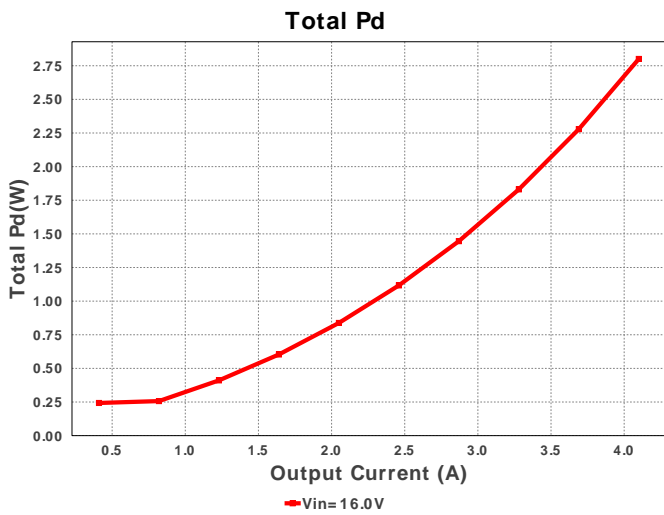
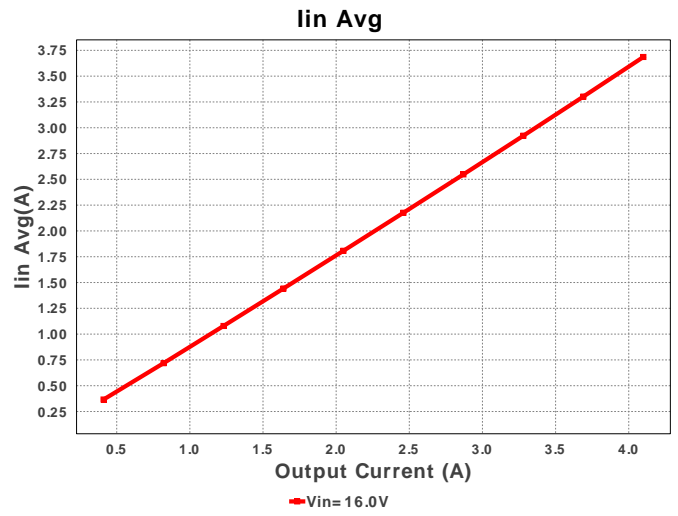
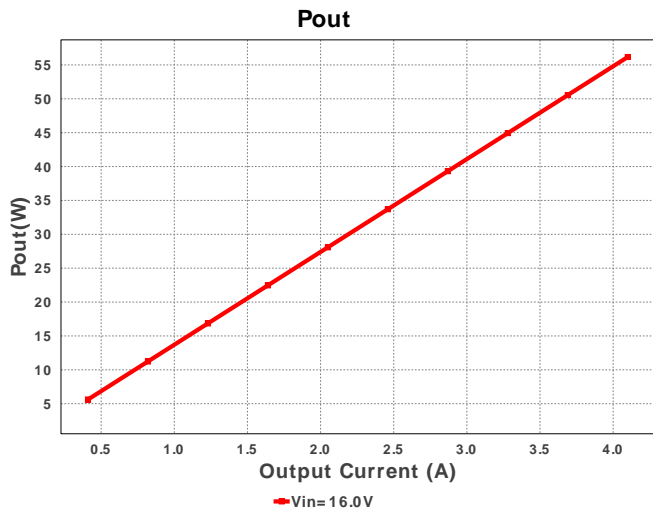
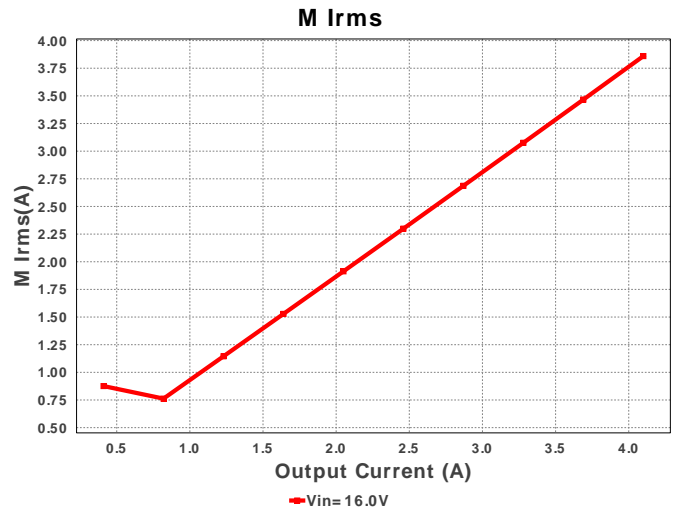
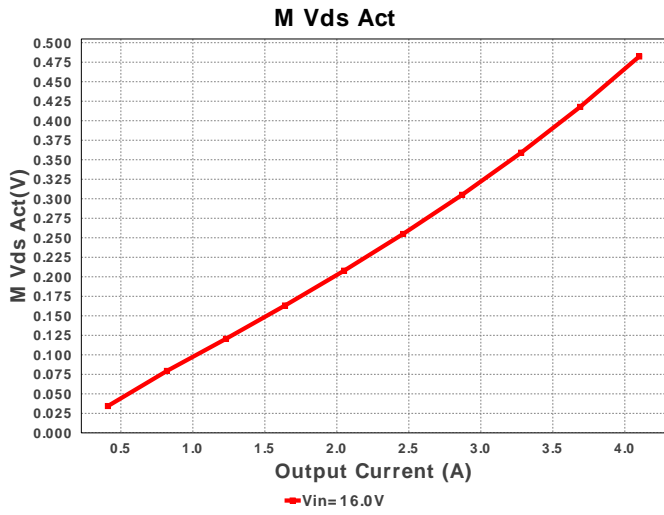
 Design : 1982346/47 LM22677J-5.0/NOPB
 LM22677J-5.0/NOPB 16.0V-16.0V to 13.70V @ 4.1A

Electrical BOM

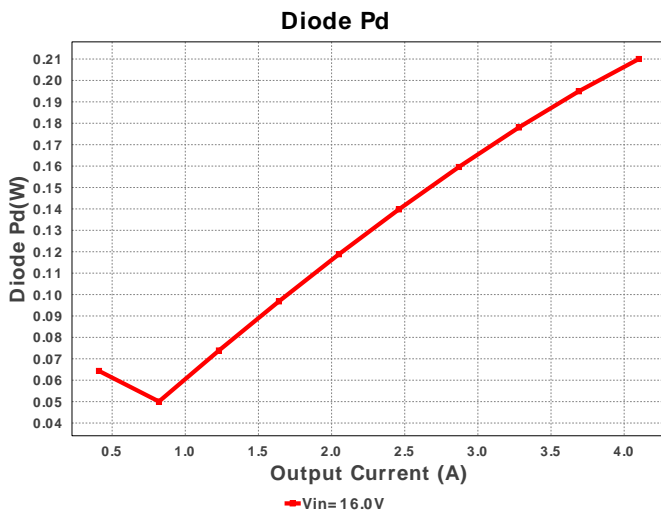
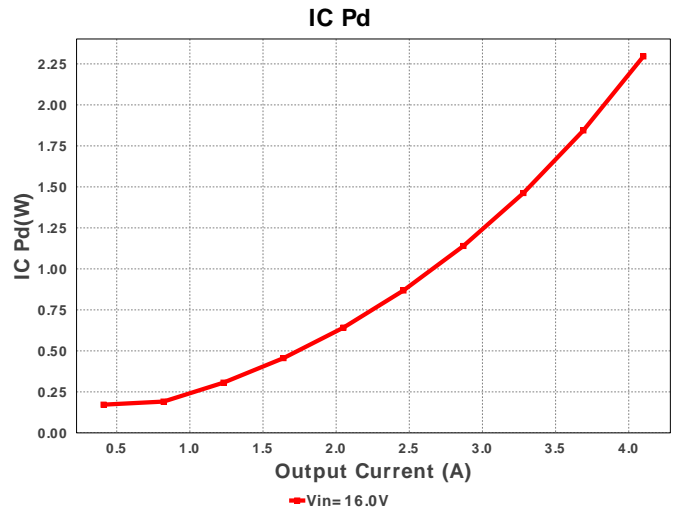
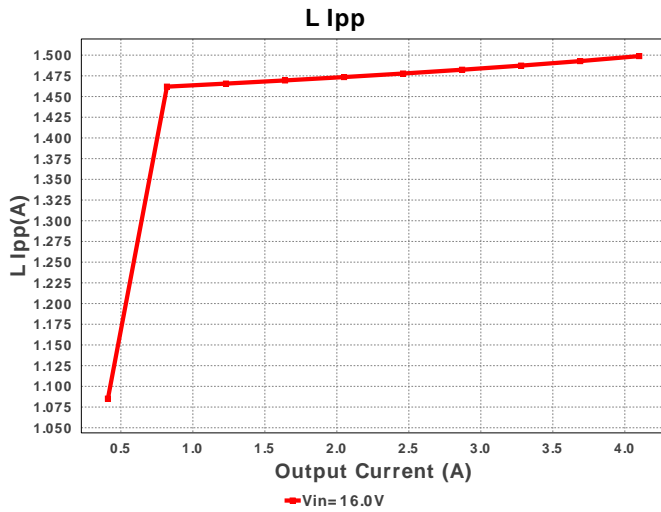
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	Kemet	C0805C103K5RACTU Series= X7R	Cap= 10.0 nF ESR= 1.739 Ohm VDC= 50.0 V IRMS= 411.0 mA	1	\$0.01	 0805 7 mm ²
2.	Cin	MuRata	GRM32ER61E226KE15L Series= X5R	Cap= 22.0 uF ESR= 2.0 mOhm VDC= 25.0 V IRMS= 3.67 A	1	\$0.28	 1210 15 mm ²
3.	Cinx	MuRata	GRM188R61E105KA12D Series= X5R	Cap= 1.0 uF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	 0603 5 mm ²
4.	Cout	Panasonic	20SVPF180M Series= 1273	Cap= 180.0 uF ESR= 25.0 mOhm VDC= 20.0 V IRMS= 3.2 A	1	\$0.50	 CAPSMT_62_E7 106 mm ²
5.	D1	Diodes Inc.	1N5819HW-7-F	VF@Io= 450.0 mV VRRM= 40.0 V	1	\$0.08	 SOD-123 13 mm ²
6.	L1	Bourns	SRR1260-4R7Y	L= 4.7 uH DCR= 15.5 mOhm	1	\$0.41	 SRR1260 210 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
7.	Rfb1	Vishay-Dale	CRCW0805619RFKEA Series= CRCW..e3	Res= 619.0 Ohm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
8.	Rfb2	Panasonic	ERJ-6ENF1001V Series= 225	Res= 1000.0 Ohm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
9.	Rt	Panasonic	ERJ-6ENF1333V Series= 225	Res= 133.0 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
10.	U1	Texas Instruments	LM22677TJ-5.0/NOPB	Switcher	1	\$2.50	 TJ7A 199 mm ²









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	1.302 A	Current	Input capacitor RMS ripple current
2.	Cout IRMS	432.677 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	4.849 A	Current	Peak switch current in IC
4.	Iin Avg	3.686 A	Current	Average input current
5.	L Ipp	1.499 A	Current	Peak-to-peak inductor ripple current
6.	M1 Irms	3.86 A	Current	Q Iavg
7.	BOM Count	10	General	Total Design BOM count
8.	FootPrint	575.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	289.328 kHz	General	Switching frequency
10.	IC Tolerance	75.0 mV	General	IC Feedback Tolerance
11.	M Vds Act	482.362 mV	General	Voltage drop across the MosFET
12.	Pout	56.17 W	General	Total output power
13.	Total BOM	\$3.82	General	Total BOM Cost
14.	D1 Tj	76.625 degC	Op_Point	D1 junction temperature
15.	Vout OP	13.7 V	Op_Point	Operational Output Voltage
16.	Cross Freq	26.155 kHz	Op_point	Bode plot crossover frequency
17.	Duty Cycle	88.617 %	Op_point	Duty cycle
18.	Efficiency	95.251 %	Op_point	Steady state efficiency
19.	IC Tj	80.506 degC	Op_point	IC junction temperature
20.	ICThetaJA	22.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
21.	IOUT_OP	4.1 A	Op_point	Iout operating point
22.	Phase Marg	88.21 deg	Op_point	Bode Plot Phase Margin
23.	VIN_OP	16.0 V	Op_point	Vin operating point
24.	Vout p-p	37.643 mV	Op_point	Peak-to-peak output ripple voltage
25.	Cin Pd	3.391 mW	Power	Input capacitor power dissipation
26.	Cout Pd	4.68 mW	Power	Output capacitor power dissipation
27.	Diode Pd	210.021 mW	Power	Diode power dissipation
28.	IC Pd	2.296 W	Power	IC power dissipation
29.	L Pd	286.61 mW	Power	Inductor power dissipation
30.	Total Pd	2.801 W	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	4.1 A	Maximum Output Current
2.	Iout1	4.1 Amps	Output Current #1
3.	VinMax	16.0 V	Maximum input voltage
4.	VinMin	16.0 V	Minimum input voltage
5.	Vout	13.7 V	Output Voltage
6.	Vout1	13.7 Volt	Output Voltage #1
7.	base_pn	LM22677	Base Product Number
8.	source	DC	Input Source Type
9.	Ta	30.0 degC	Ambient temperature

Design Assistance

1. Why WEBENCH recommends the 5.0 option for your 13.7V output: The internal compensation for the ADJ version of the LM22677 is optimized for output voltages below 5V. Therefore it is recommended that for outputs greater than 5V, the 5.0 option be used with an additional external resistive feedback divider. Part Description The LM22677 is a monolithic integrated circuit that provides all of the active functions for a step-down (buck) switching regulator capable of driving up to 5.0A loads with excellent line and load regulation characteristics. High efficiency (>90%) is obtained through the use of a low ON-resistance N-channel MOSFET.

2. **LM22677** Product Folder : <http://www.ti.com/product/lm22677> : contains the data sheet and other resources.

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You should completely validate and test your design implementation to confirm the system functionality for your application prior to production.

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