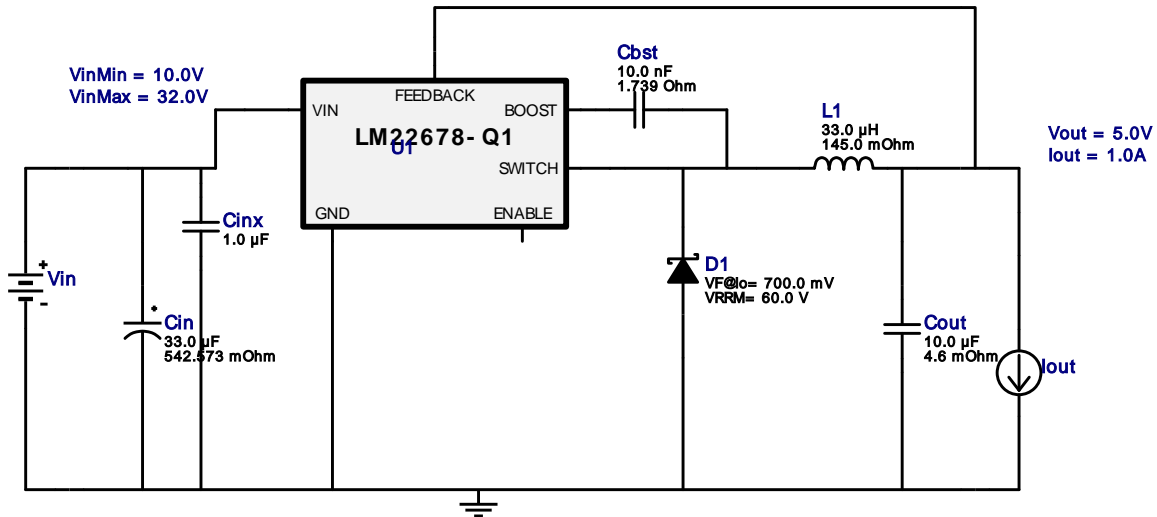

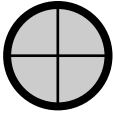







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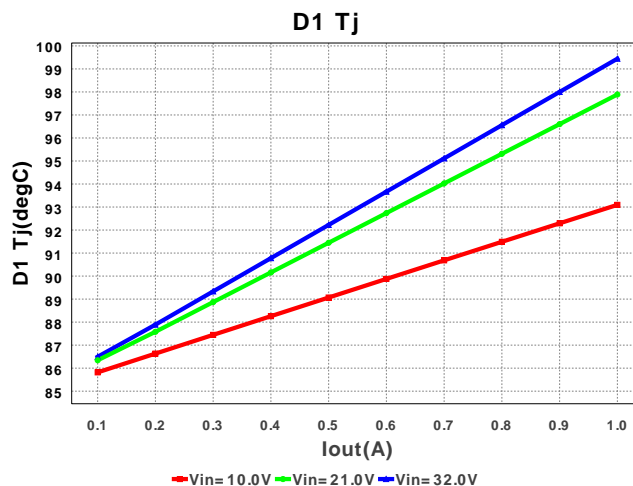
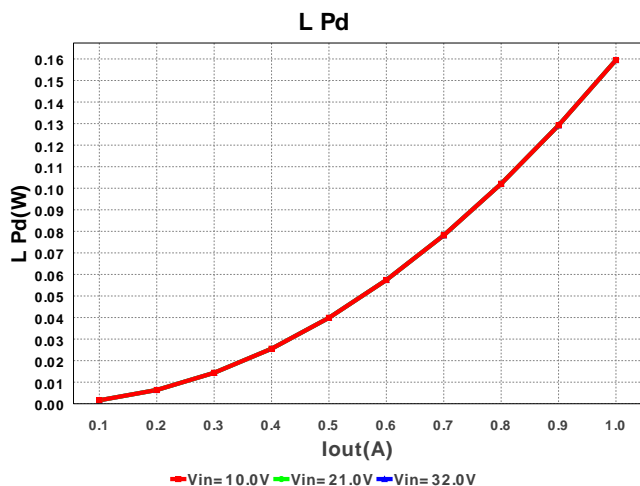
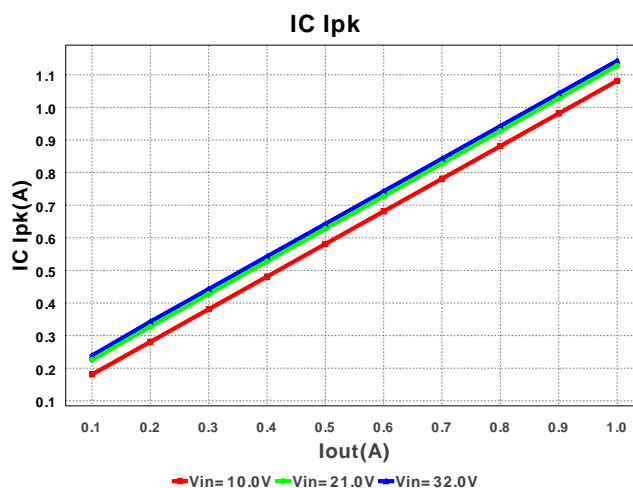
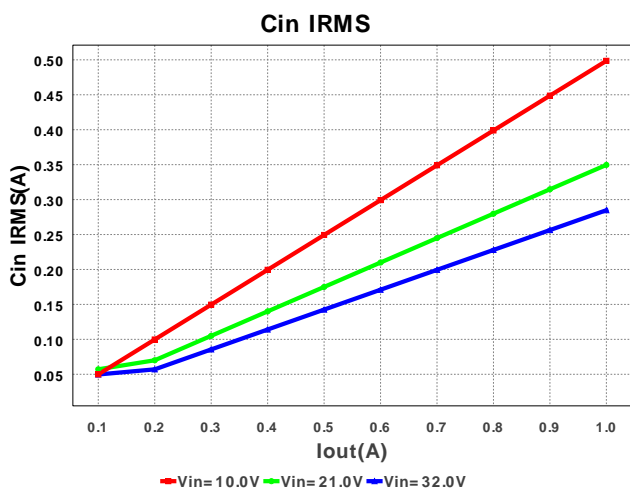
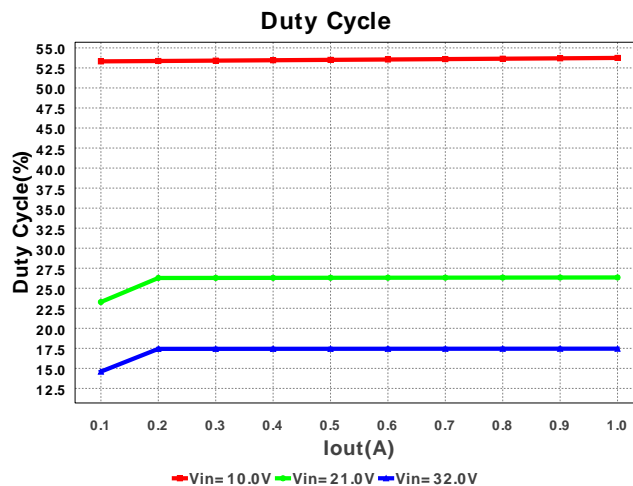
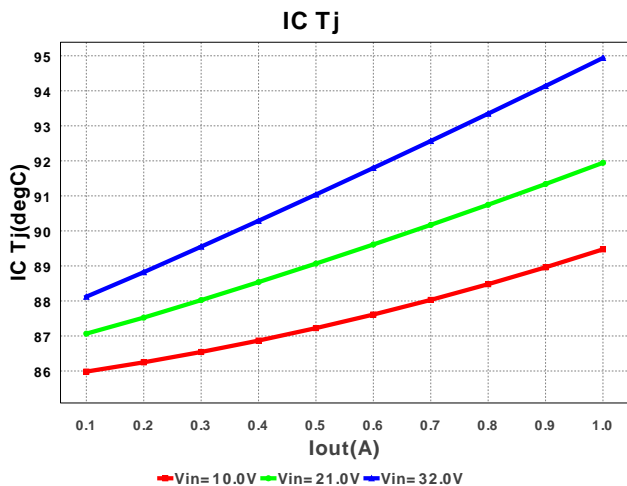
 Design : 3485195/8 LM22678QJTJ-5.0/NOPB
 LM22678QJTJ-5.0/NOPB 10.0V-32.0V to 5.0V @ 1.0A


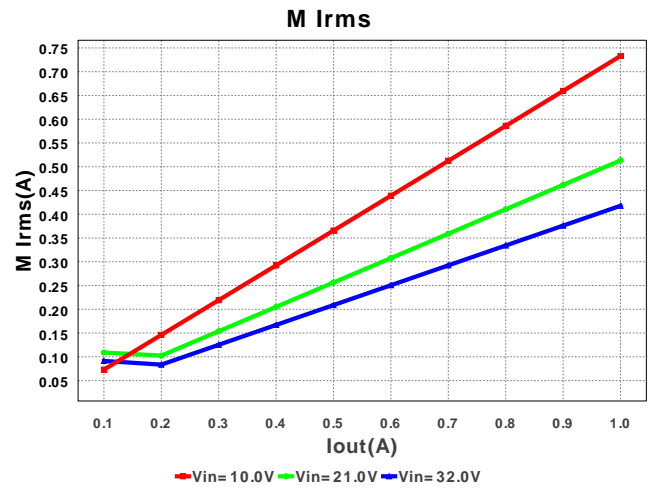
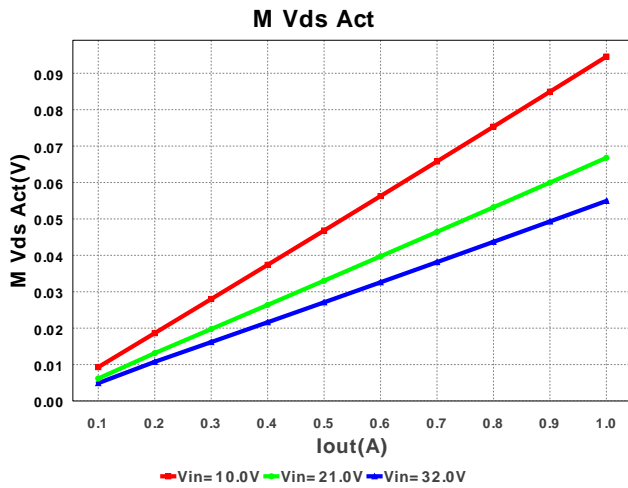
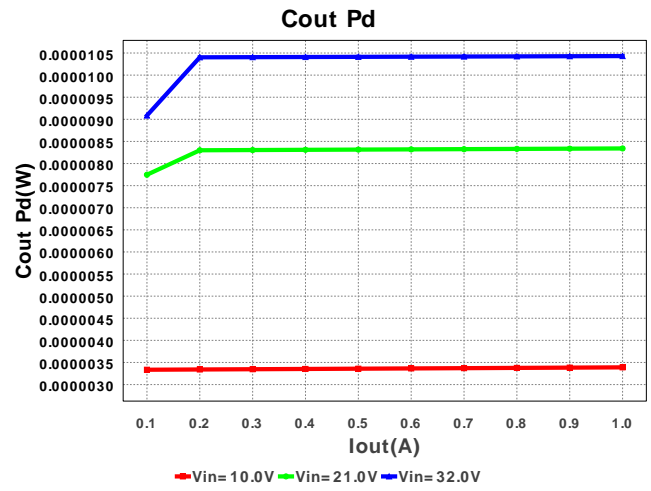
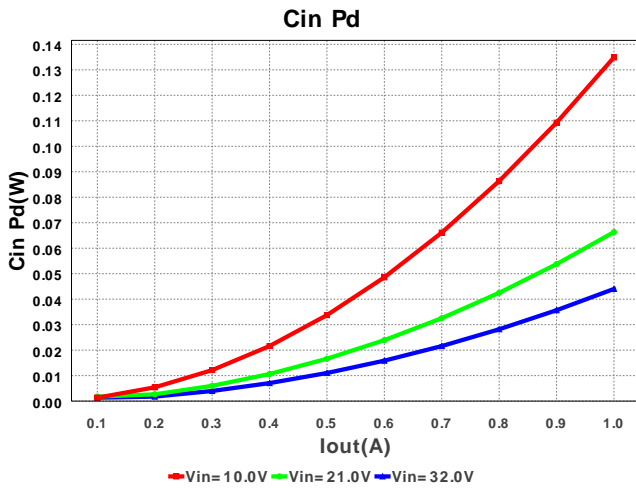
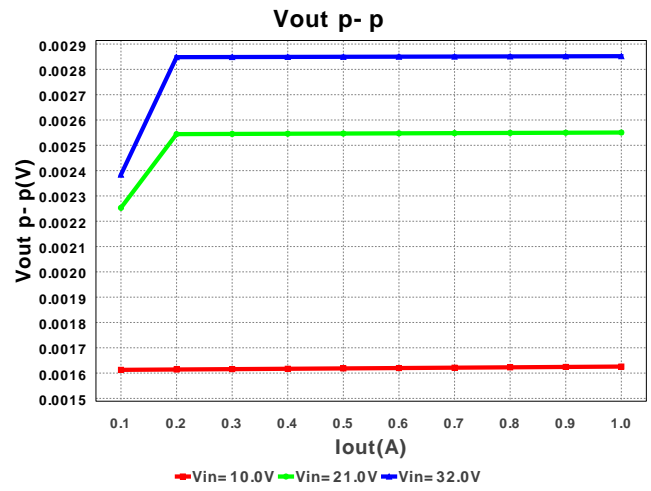
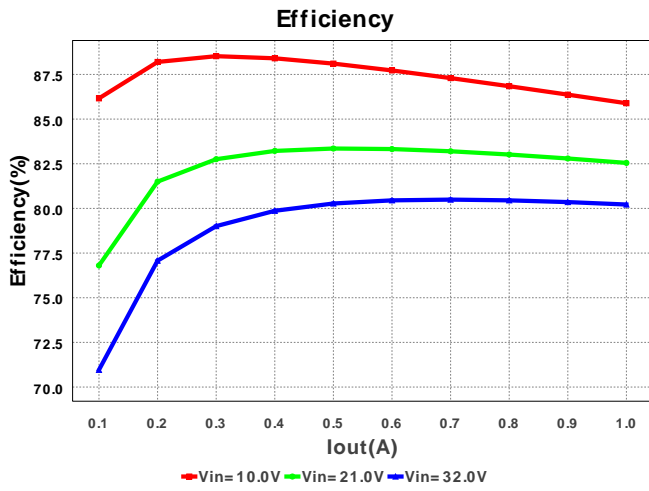
1. This regulator device is qualified for Automotive applications. All passives and other components selected in this design may not be qualified for Automotive applications. The user is required to verify that all components in the design meet the qualification and safety requirements for their specific application. View WEBENCH(R) Disclaimer.

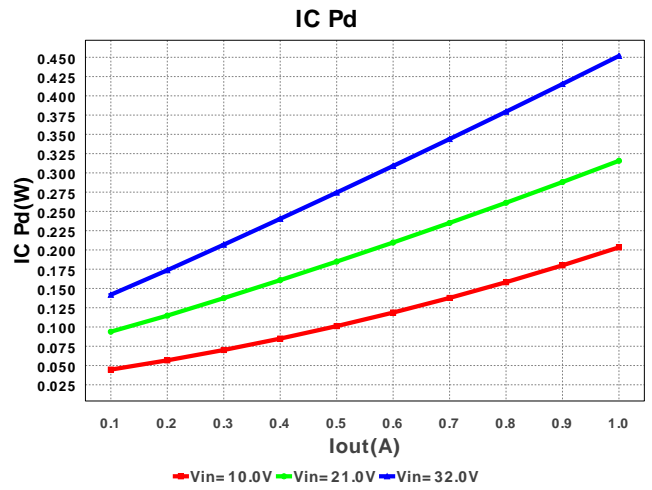
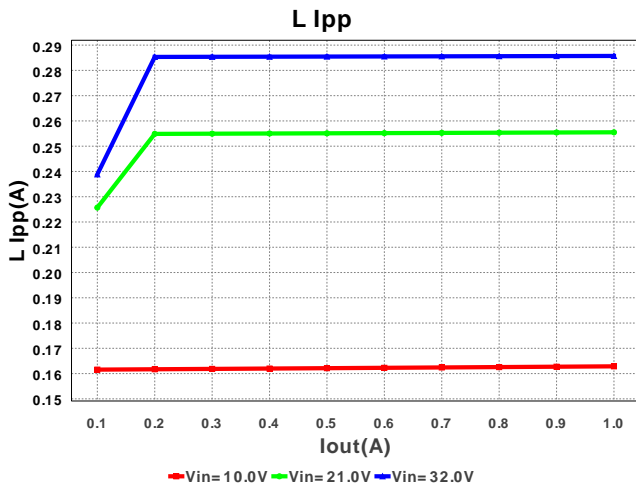
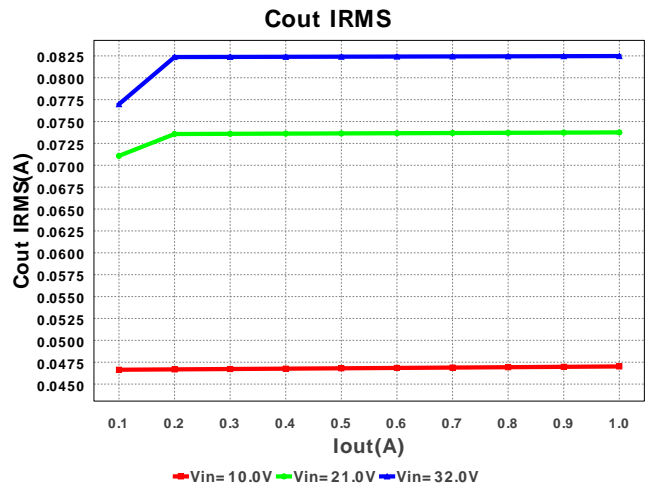
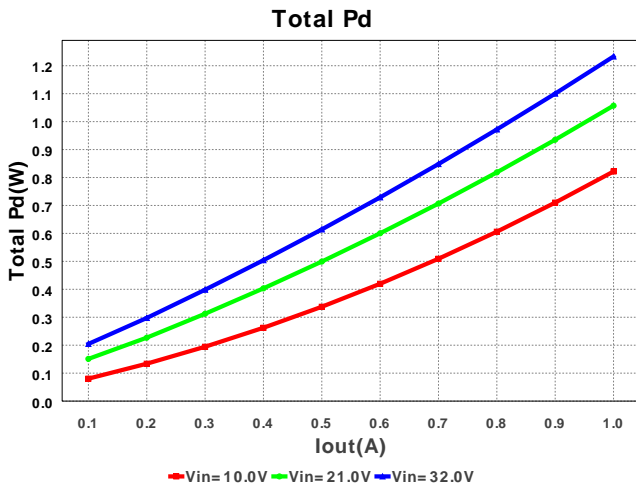
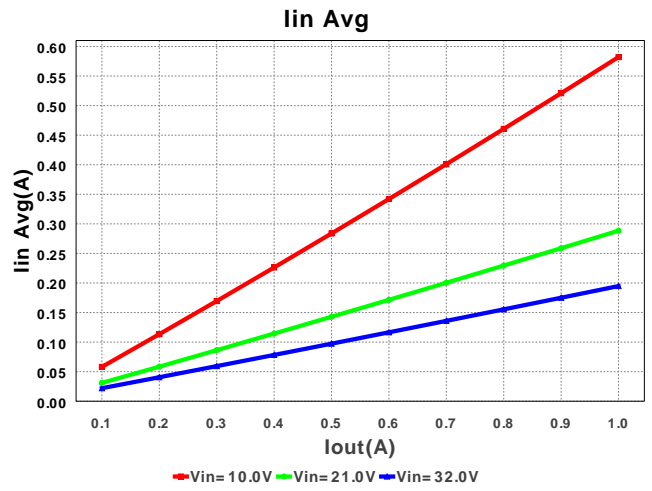
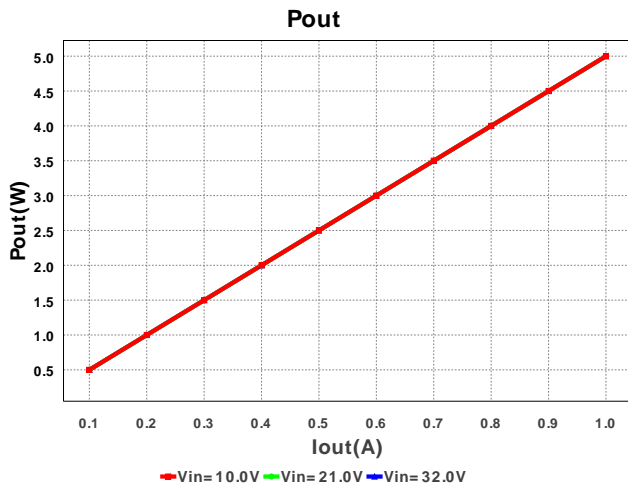
Electrical BOM

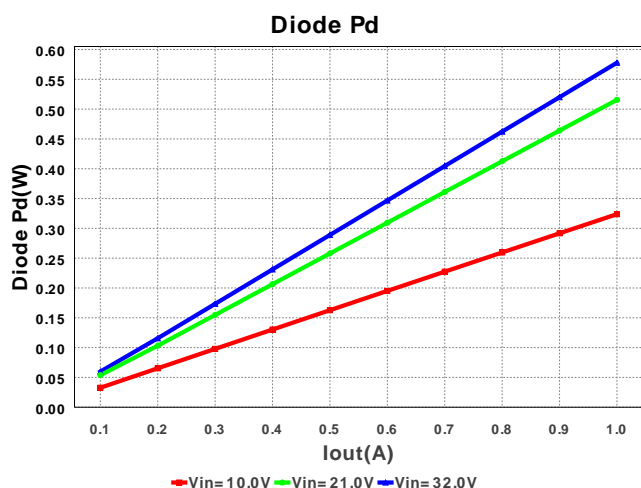
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	Kemet	C0805C103K5RACTU Series= X7R	Cap= 10.0 nF ESR= 1.739 Ohm VDC= 50.0 V IRMS= 411.0 mA	1	\$0.01	 0805 13mm2
2.	Cin	Panasonic	EEUED2D330 Series= 286	Cap= 33.0 µF ESR= 542.573 mOhm VDC= 200.0 V IRMS= 650.0 mA	1	\$0.19	 CAPP5-10X20 144mm2
3.	Cinx	MuRata	GRM21BR71H105KA12L Series= X7R	Cap= 1.0 µF VDC= 50.0 V IRMS= 0.0 A	1	\$0.10	 0805 13mm2
4.	Cout	TDK	C3216X5R1A106M Series= X5R	Cap= 10.0 µF ESR= 4.6 mOhm VDC= 10.0 V IRMS= 2.7 A	3	\$0.06	 1206 19mm2
5.	D1	Diodes Inc.	B260A-13-F	VF@Io= 700.0 mV VRRM= 60.0 V	1	\$0.11	 SMA 37mm2
6.	L1	Bourns	SRN8040-330M	L= 33.0 µH DCR= 145.0 mOhm	1	\$0.21	 SRN8040 100mm2

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
7.	U1	Texas Instruments	LM22678QTJ-5.0/NOPB	Switcher	1	\$2.65	 TJ7A 199mm2









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	284.8 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	82.48 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	1.143 A	Current	Peak switch current in IC
4.	Iin Avg	194.78 mA	Current	Average input current
5.	L Ipp	285.718 mA	Current	Peak-to-peak inductor ripple current
6.	M1 Irms	417.858 mA	Current	Q lavg
7.	BOM Count	9	General	Total Design BOM count
8.	FootPrint	562.0 mm2	General	Total Foot Print Area of BOM components
9.	Frequency	500.0 kHz	General	Switching frequency
10.	IC Tolerance	75.0 mV	General	IC Feedback Tolerance
11.	M Vds Act	54.937 mV	General	Voltage drop across the MosFET
12.	Mode	CCM	General	Conduction Mode
13.	Pout	5.0 W	General	Total output power
14.	Total BOM	\$3.45	General	Total BOM Cost
15.	D1 Tj	99.444 degC	Op_Point	D1 junction temperature
16.	Vout OP	5.0 V	Op_Point	Operational Output Voltage
17.	Cross Freq	49.444 kHz	Op_point	Bode plot crossover frequency
18.	Duty Cycle	17.461 %	Op_point	Duty cycle
19.	Efficiency	80.218 %	Op_point	Steady state efficiency
20.	IC Tj	94.939 degC	Op_point	IC junction temperature
21.	ICThetaJA	22.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
22.	IOUT_OP	1.0 A	Op_point	Iout operating point
23.	Phase Marg	45.248 deg	Op_point	Bode Plot Phase Margin
24.	VIN_OP	32.0 V	Op_point	Vin operating point
25.	Vout p-p	2.852 mV	Op_point	Peak-to-peak output ripple voltage
26.	Cin Pd	44.009 mW	Power	Input capacitor power dissipation
27.	Cout Pd	10.431 μW	Power	Output capacitor power dissipation
28.	Diode Pd	577.776 mW	Power	Diode power dissipation
29.	IC Pd	451.756 mW	Power	IC power dissipation
30.	L Pd	159.5 mW	Power	Inductor power dissipation
31.	Total Pd	1.233 W	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	1.0 A	Maximum Output Current
2.	Iout1	1.0 Amps	Output Current #1
3.	VinMax	32.0 V	Maximum input voltage
4.	VinMin	10.0 V	Minimum input voltage
5.	Vout	5.0 V	Output Voltage
6.	Vout1	5.0 Volt	Output Voltage #1
7.	base_pn	LM22678-Q1	National Based Product Number
8.	source	DC	Input Source Type
9.	Ta	85.0 degC	Ambient temperature

Design Assistance

1. Feature Highlights: Automotive Qualified 4.5V to 18V Vin, 3A Synchronous DCAP2 Mode Buck Converter
2. The LM22678-Q1 is qualified for Automotive applications. All passives and other components selected in this design may not be qualified for Automotive applications. The user is required to verify that all components in the design meet the qualification and safety requirements for their specific application

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4. **LM22678-Q1** Product Folder : <http://www.ti.com/product/lm22678-q1> : contains the data sheet and other resources.

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