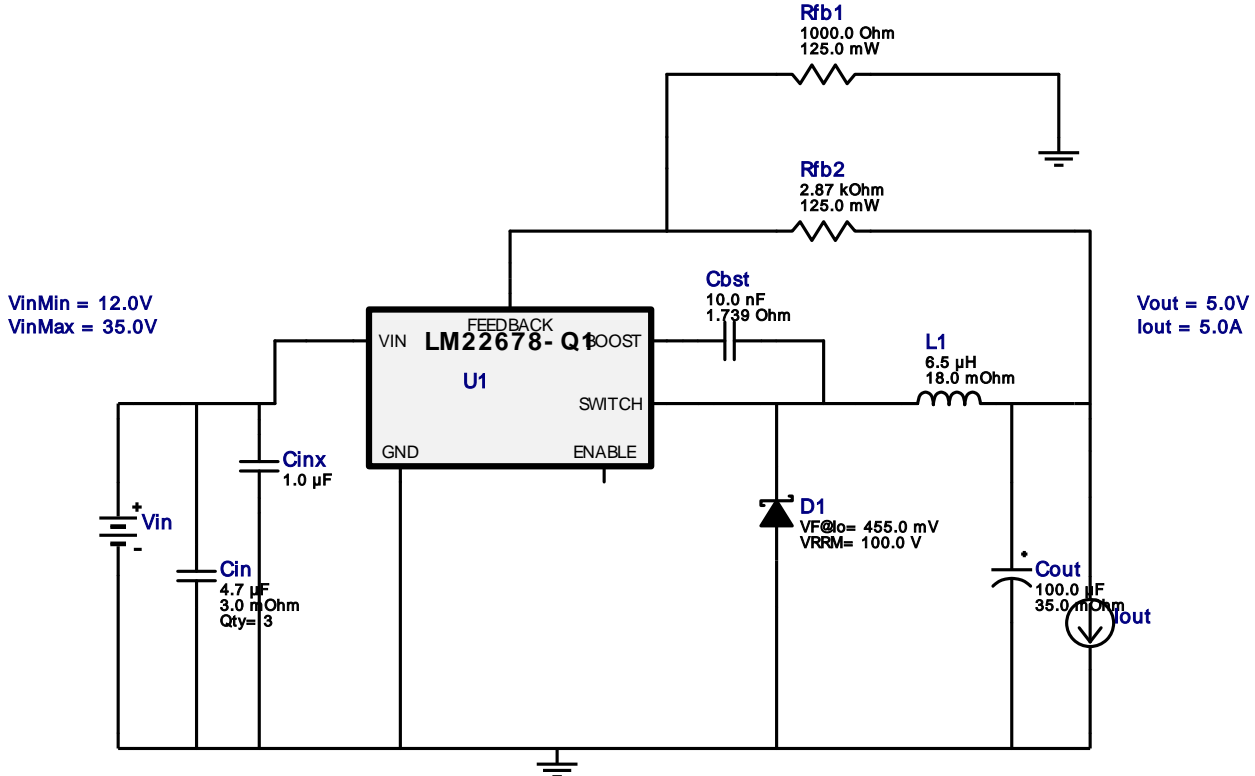







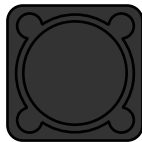



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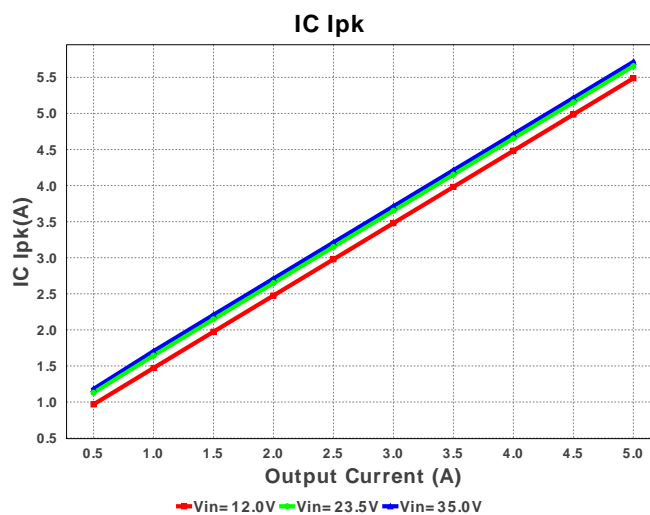
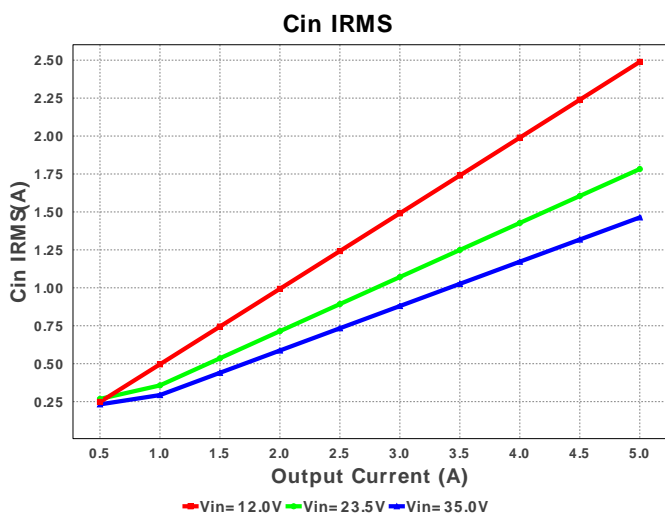
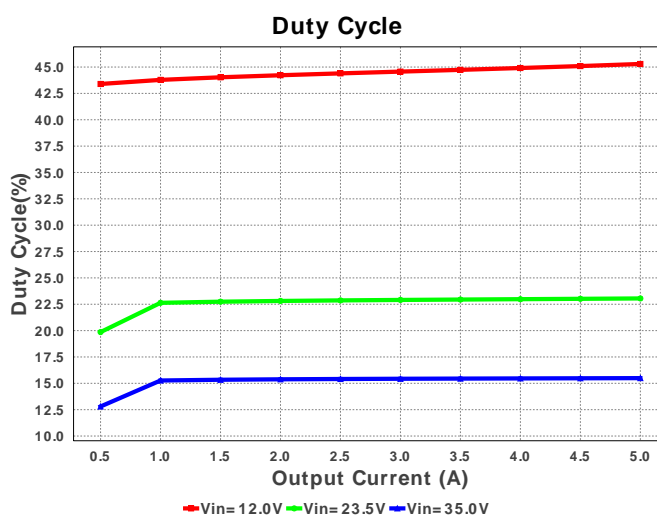
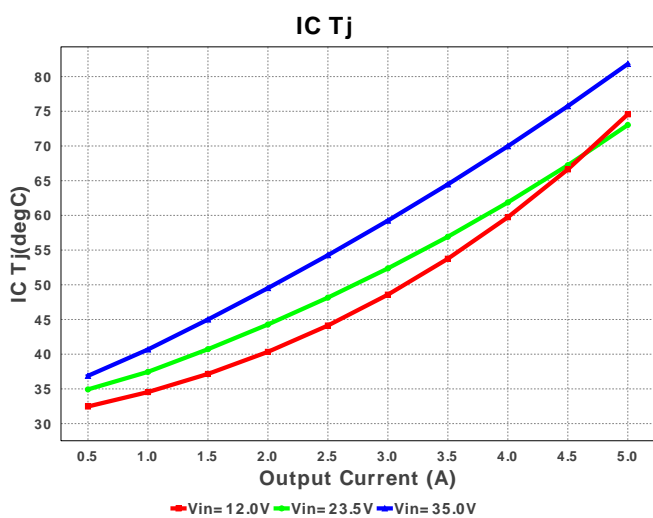
 Design : 1982346/68 LM22678QTJ-ADJ/NOPB
 LM22678QTJ-ADJ/NOPB 12.0V-35.0V to 5.00V @ 5.0A


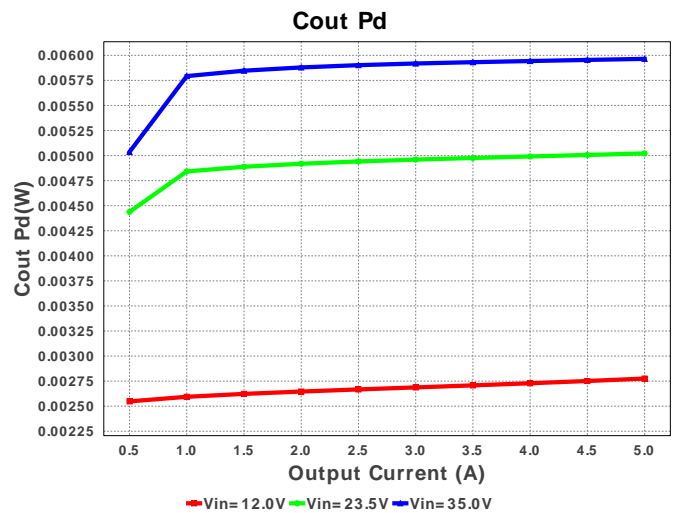
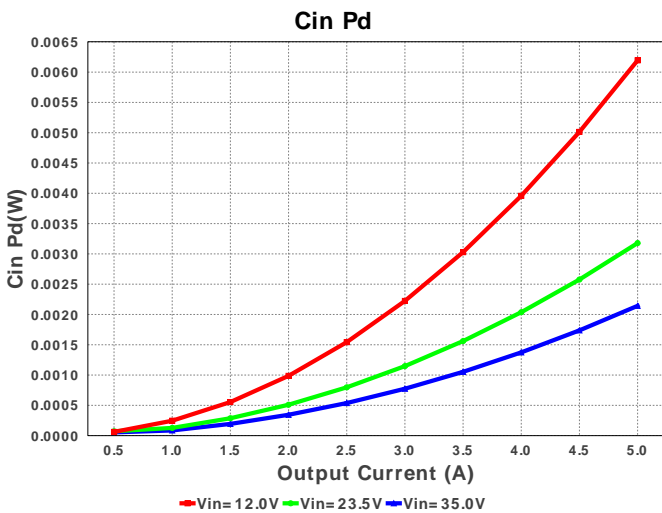
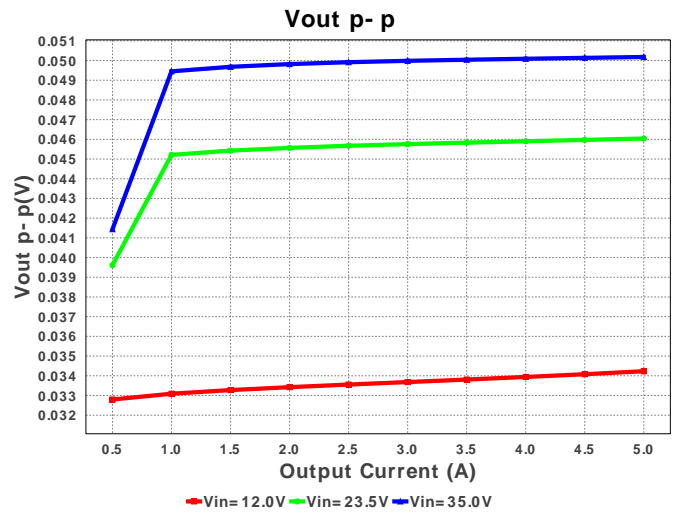
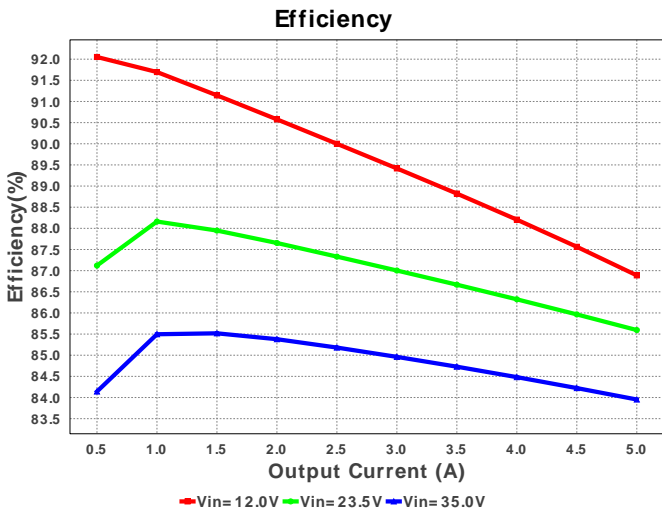
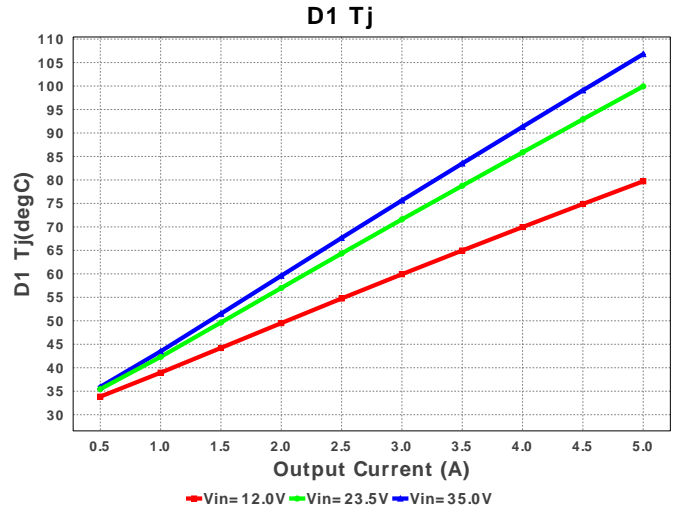
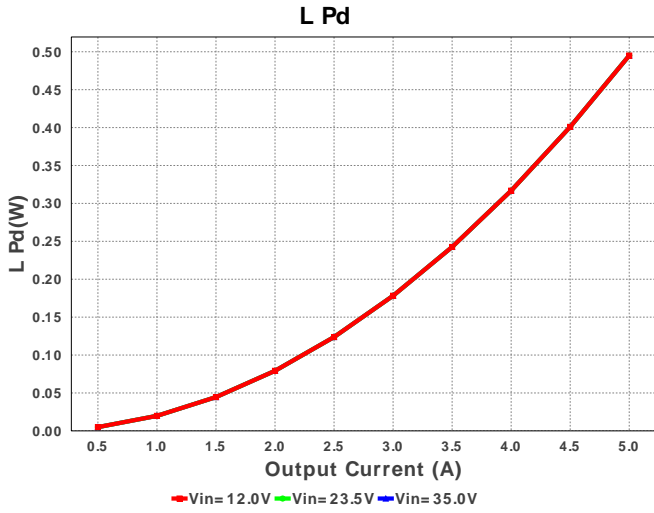
1. This regulator device is qualified for Automotive applications. All passives and other components selected in this design may not be qualified for Automotive applications. The user is required to verify that all components in the design meet the qualification and safety requirements for their specific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

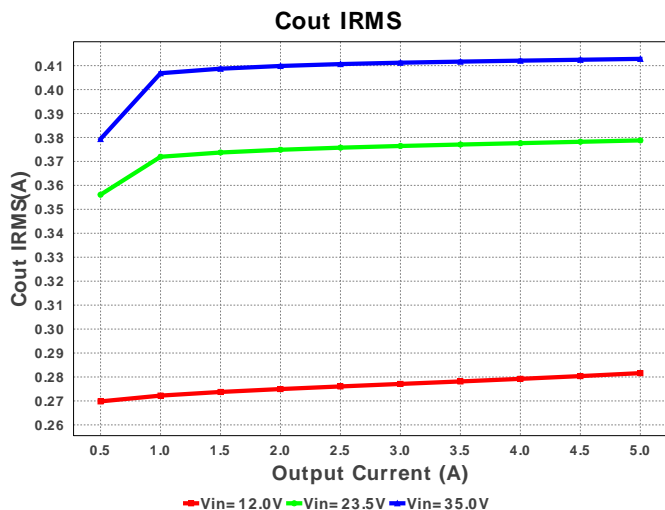
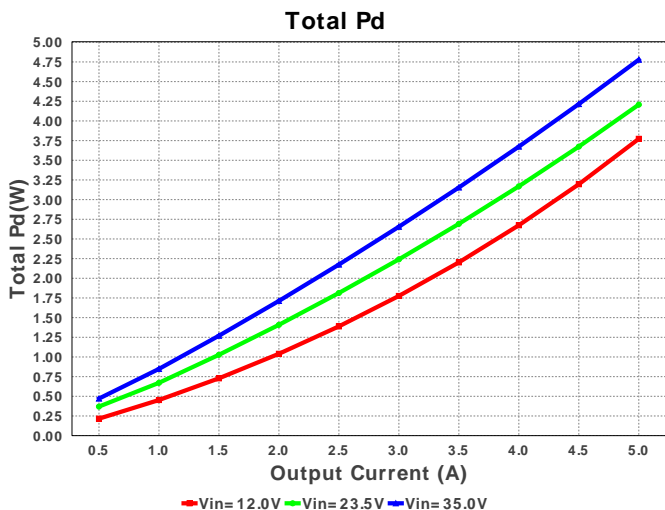
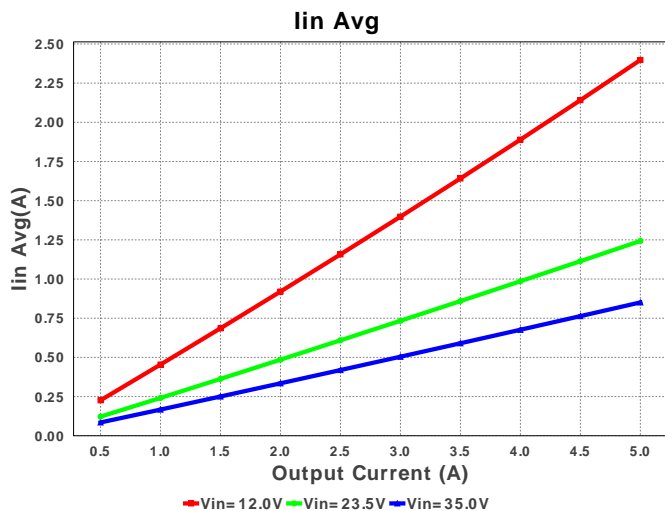
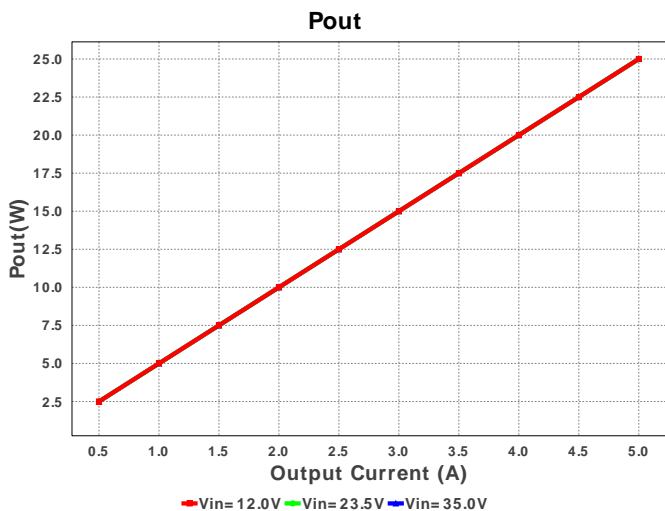
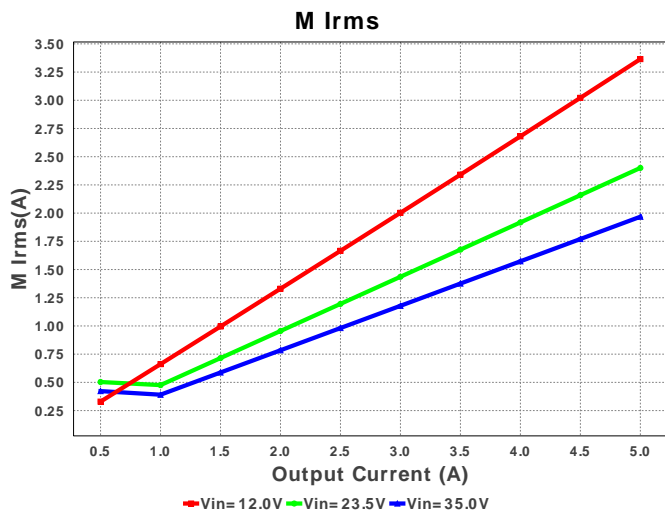
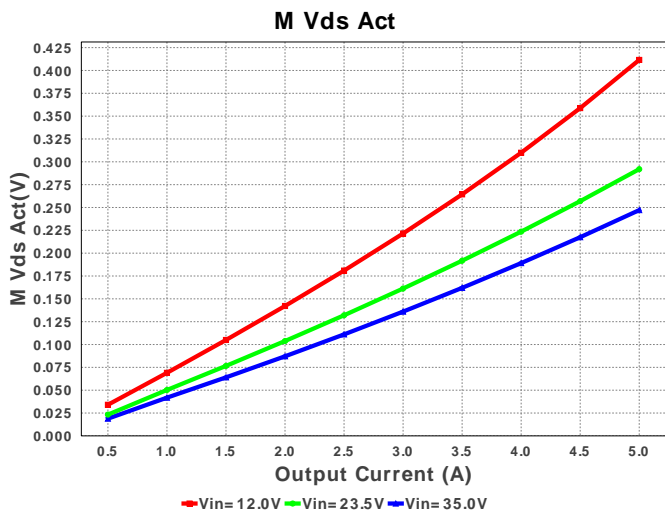
Electrical BOM

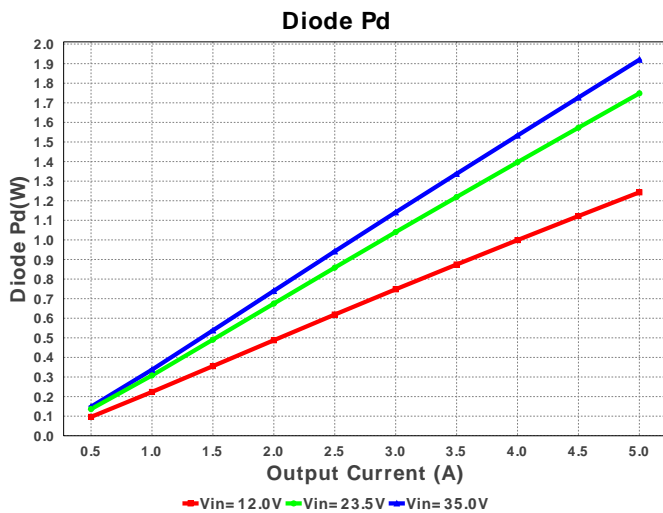
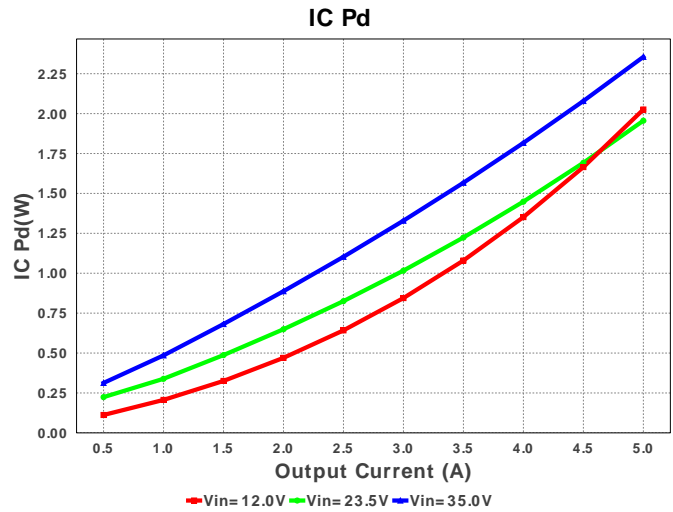
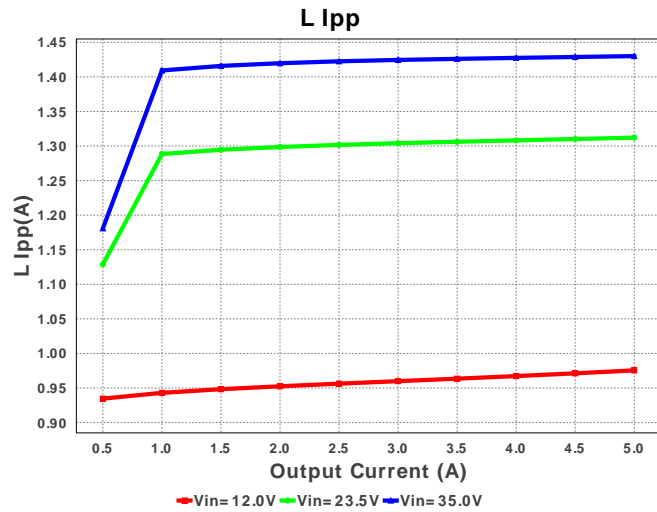
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	Kemet	C0805C103K5RACTU Series= X7R	Cap= 10.0 nF ESR= 1.739 Ohm VDC= 50.0 V IRMS= 411.0 mA	1	\$0.01	 0805 7 mm ²
2.	Cin	MuRata	GRM31CR71H475KA12L Series= X7R	Cap= 4.7 uF ESR= 3.0 mOhm VDC= 50.0 V IRMS= 4.98 A	3	\$0.07	 1206 11 mm ²
3.	Cinx	MuRata	GRM21BR71H105KA12L Series= X7R	Cap= 1.0 uF VDC= 50.0 V IRMS= 0.0 A	1	\$0.10	 0805 7 mm ²
4.	Cout	Panasonic	8TPE100MAZB Series= 1281	Cap= 100.0 uF ESR= 35.0 mOhm VDC= 8.0 V IRMS= 1.4 A	1	\$0.48	 3528-21 17 mm ²
5.	D1	STMicroelectronics	STPS20M100SG-TR	VF@Io= 455.0 mV VRRM= 100.0 V	1	\$1.33	 DDPAK 210 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
6.	L1	Bourns	SRR1208-6R5ML	L= 6.5 μ H DCR= 18.0 mOhm	1	\$0.37	 SRR1208 216 mm ²
7.	Rfb1	Panasonic	ERJ-6ENF1001V Series= 225	Res= 1000.0 Ohm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
8.	Rfb2	Panasonic	ERJ-6ENF2871V Series= 225	Res= 2.87 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
9.	U1	Texas Instruments	LM22678QTJ-ADJ/NOPB	Switcher	1	\$2.65	 TJ7A 199 mm ²









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	1.464 A	Current	Input capacitor RMS ripple current
2.	Cout IRMS	412.86 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	5.715 A	Current	Peak switch current in IC
4.	Iin Avg	850.89 mA	Current	Average input current
5.	L Ipp	1.43 A	Current	Peak-to-peak inductor ripple current
6.	M1 Irms	1.968 A	Current	Q lavg
7.	BOM Count	11	General	Total Design BOM count
8.	FootPrint	701.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	500.0 kHz	General	Switching frequency
10.	IC Tolerance	19.0 mV	General	IC Feedback Tolerance
11.	M Vds Act	247.131 mV	General	Voltage drop across the MosFET
12.	Pout	25.0 W	General	Total output power
13.	Total BOM	\$5.17	General	Total BOM Cost
14.	D1 Tj	106.902 degC	Op_Point	D1 junction temperature
15.	Vout OP	5.0 V	Op_Point	Operational Output Voltage
16.	Cross Freq	43.335 kHz	Op_point	Bode plot crossover frequency
17.	Duty Cycle	15.494 %	Op_point	Duty cycle
18.	Efficiency	83.946 %	Op_point	Steady state efficiency
19.	IC Tj	81.818 degC	Op_point	IC junction temperature
20.	ICThetaJA	22.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
21.	IOUT_OP	5.0 A	Op_point	Iout operating point
22.	Phase Marg	91.548 deg	Op_point	Bode Plot Phase Margin
23.	VIN_OP	35.0 V	Op_point	Vin operating point
24.	Vout p-p	50.184 mV	Op_point	Peak-to-peak output ripple voltage
25.	Cin Pd	2.143 mW	Power	Input capacitor power dissipation
26.	Cout Pd	5.966 mW	Power	Output capacitor power dissipation
27.	Diode Pd	1.923 W	Power	Diode power dissipation
28.	IC Pd	2.355 W	Power	IC power dissipation
29.	L Pd	495.0 mW	Power	Inductor power dissipation
30.	Total Pd	4.781 W	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	5.0	Maximum Output Current
2.	Iout1	5.0	Output Current #1
3.	VinMax	35.0	Maximum input voltage
4.	VinMin	12.0	Minimum input voltage
5.	Vout	5.0	Output Voltage
6.	Vout1	5.0	Output Voltage #1
7.	base_pn	LM22678-Q1	Base Product Number
8.	source	DC	Input Source Type
9.	Ta	30.0	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%2Dq1> : contains the data sheet and other resources.

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