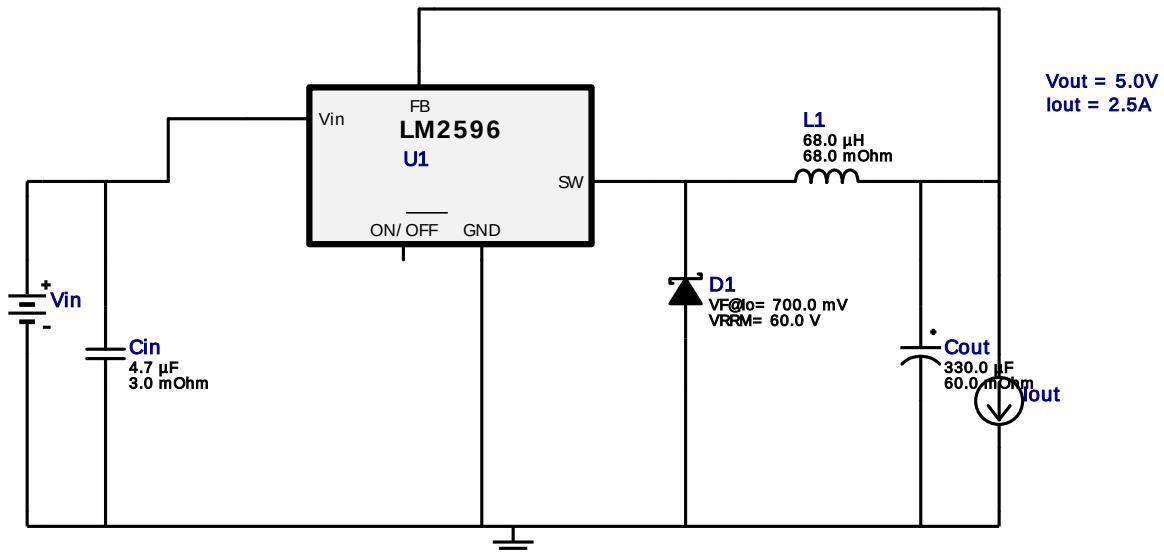


WEBENCH® Design Report

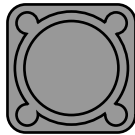
Design : 973400/70 LM2596SX-5.0/NOPB
LM2596SX-5.0/NOPB 20.0V-24.0V to 5.00V @ 2.5A

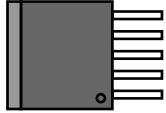


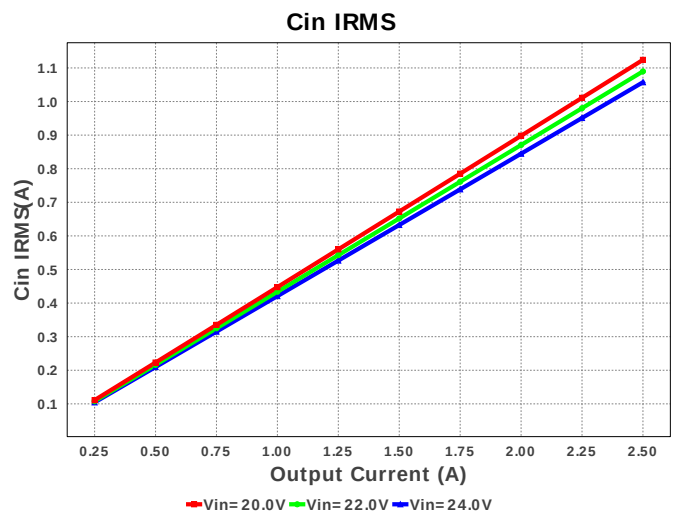
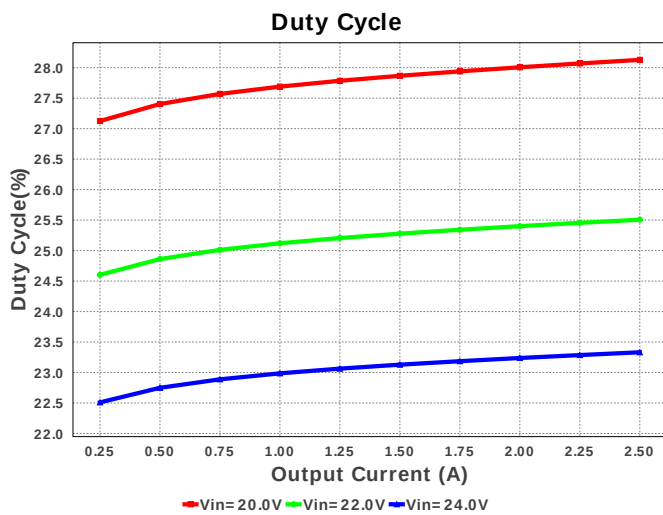
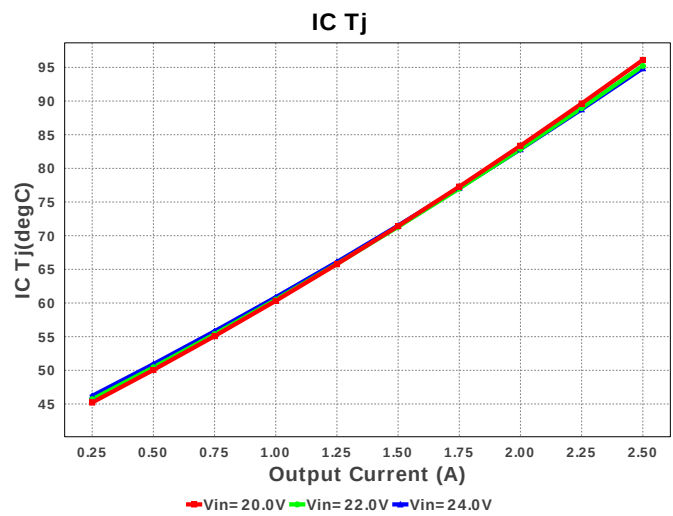
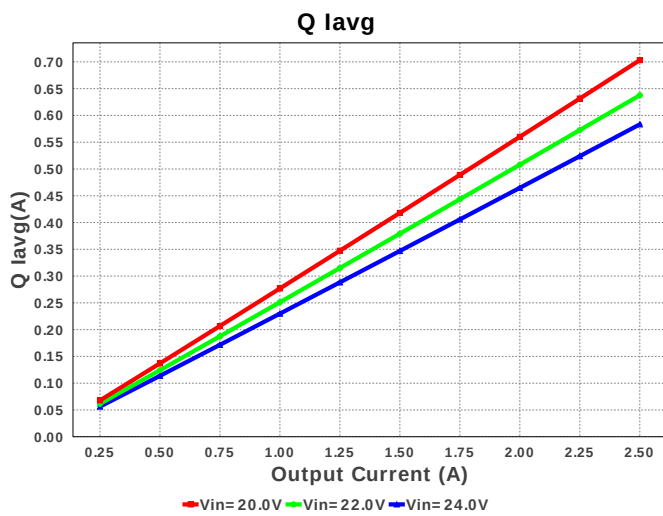
My Comments

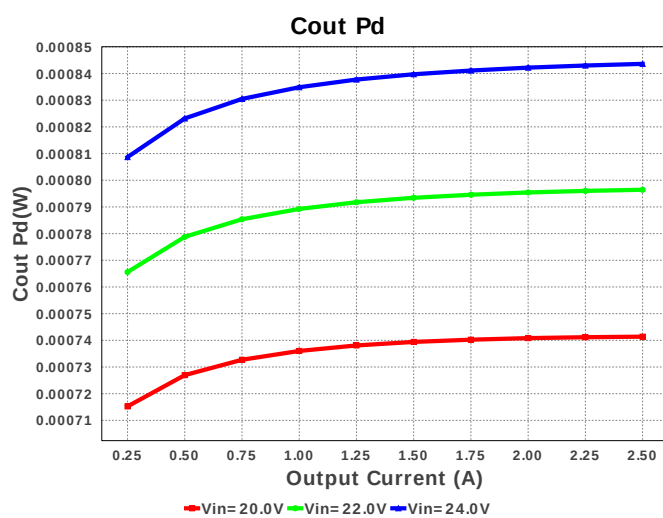
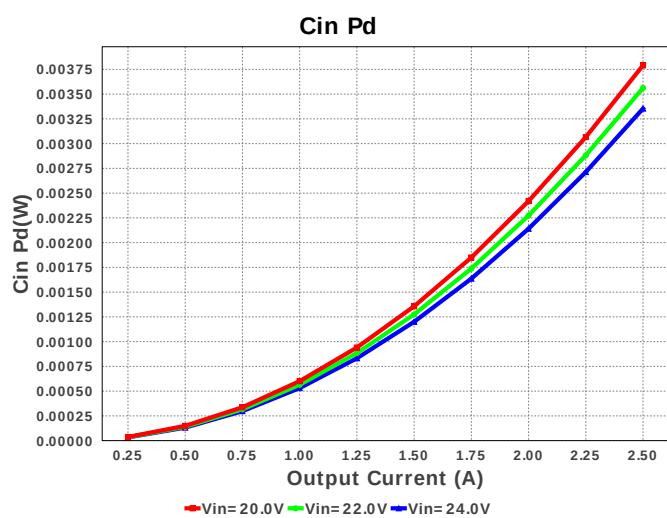
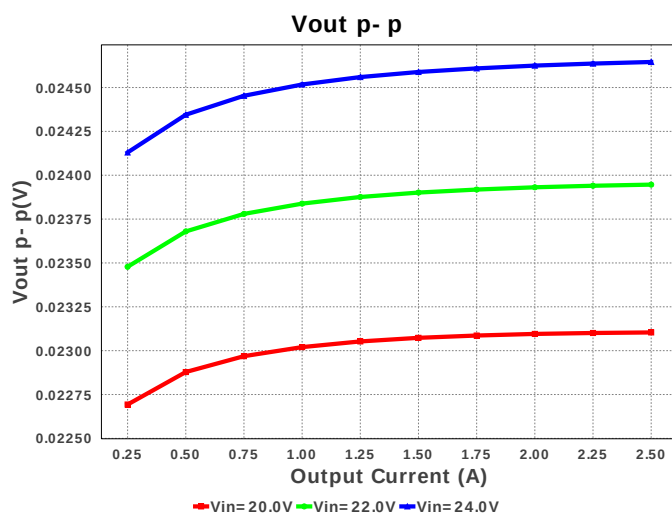
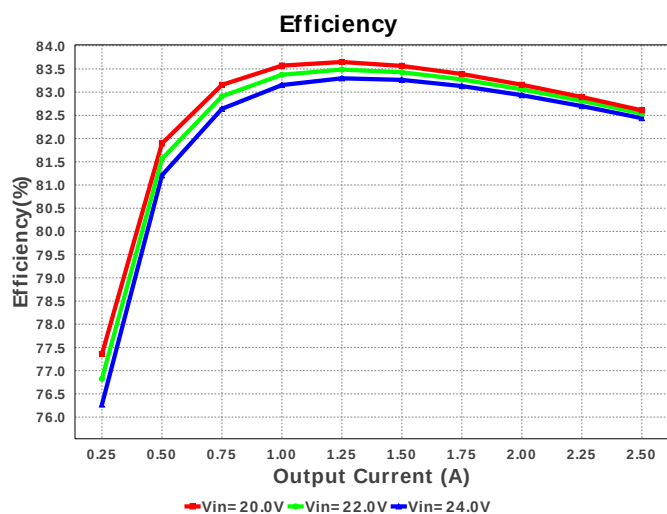
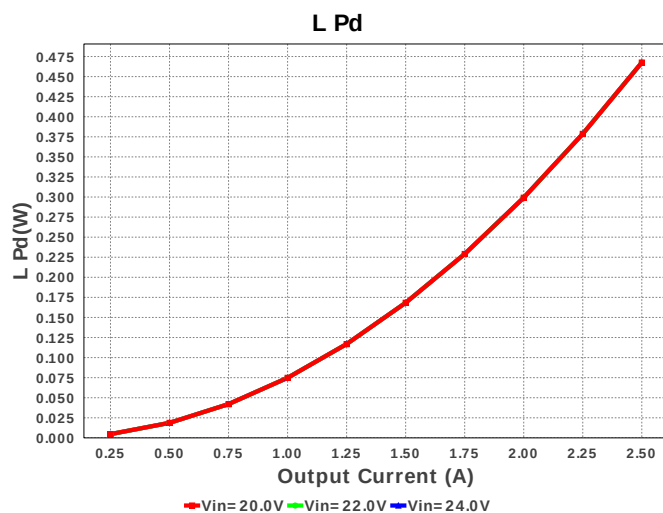
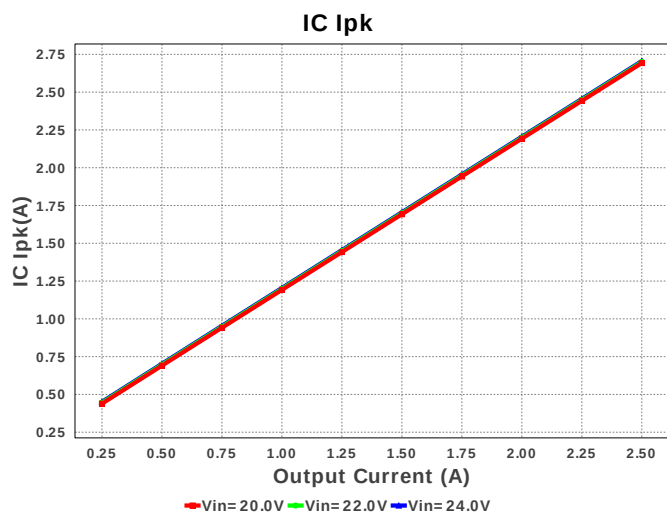
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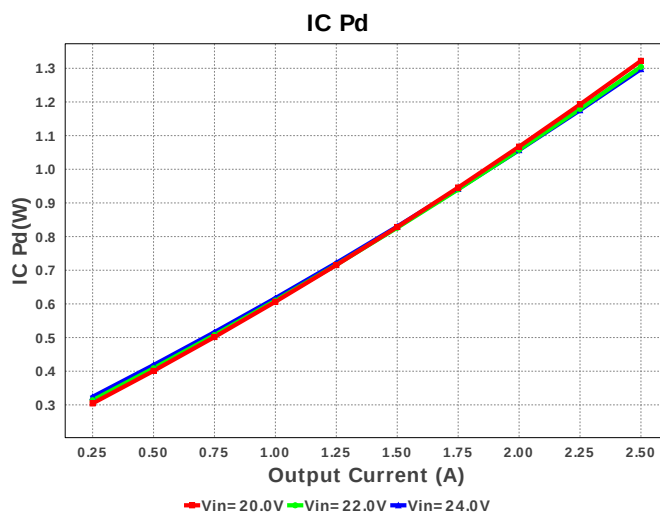
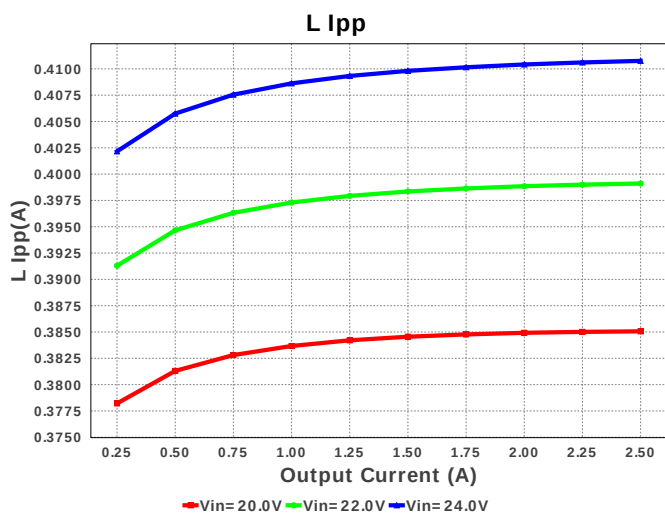
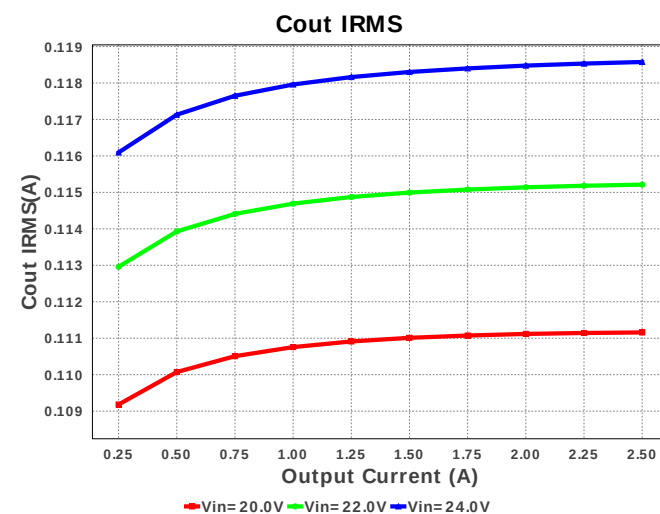
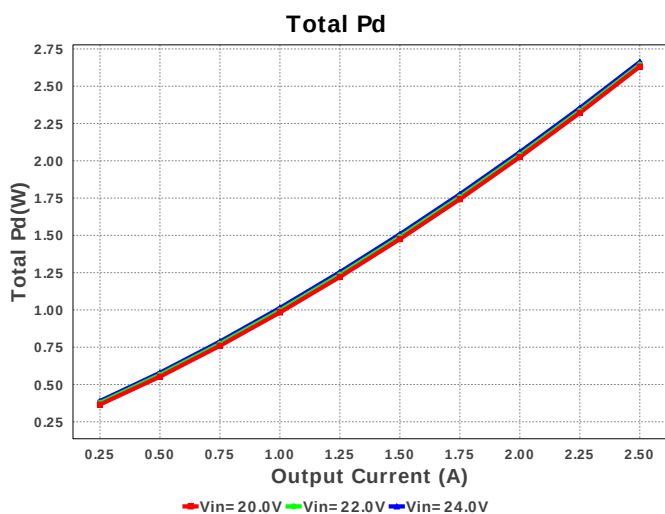
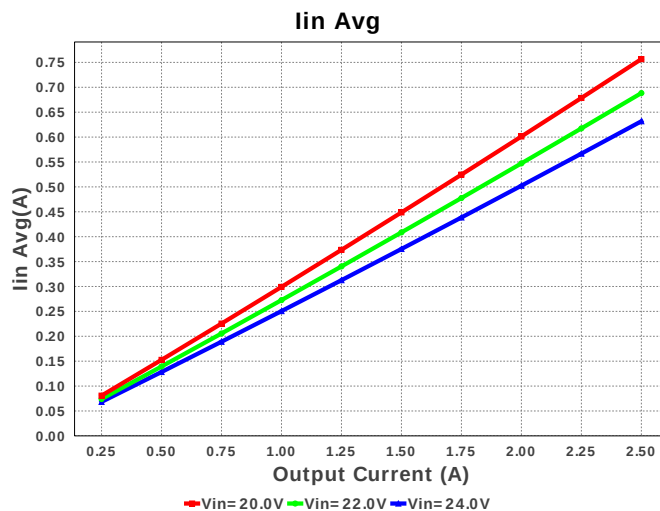
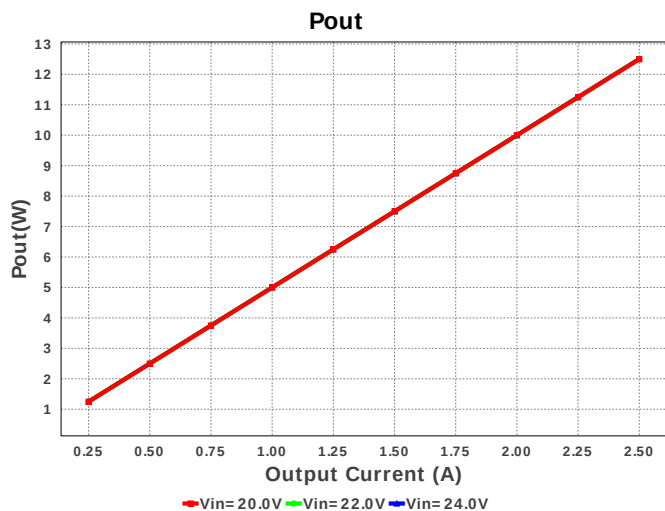
Electrical BOM

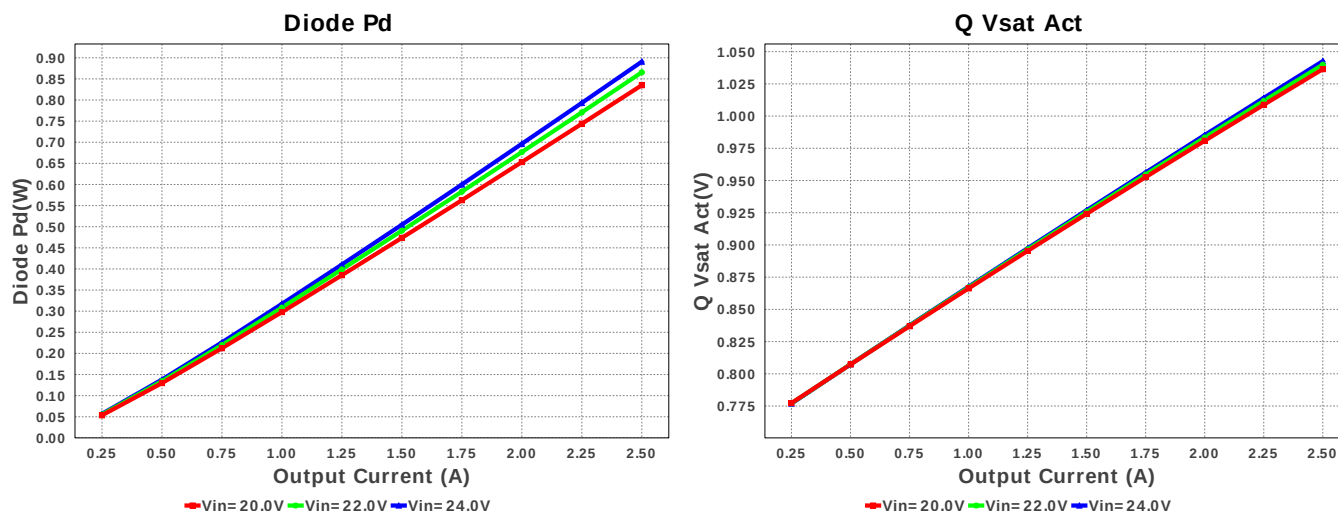
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM31CR71H475KA12L Series= X7R	Cap= 4.7 uF ESR= 3.0 mOhm VDC= 50.0 V IRMS= 4.98 A	1	\$0.07	 1206 11 mm ²
2.	Cout	Kemet	T495X337K010ATE060 Series= T495	Cap= 330.0 uF ESR= 60.0 mOhm VDC= 10.0 V IRMS= 1.492 A	1	\$0.96	 7343-43 59 mm ²
3.	D1	Diodes Inc.	B560C-13-F	VF@Io= 700.0 mV VRRM= 60.0 V	1	\$0.17	 SMC 83 mm ²
4.	L1	Coilcraft	MSS1210-683MEB	L= 68.0 µH DCR= 68.0 mOhm	1	\$0.81	 MSS1210 204 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
5.	U1	Texas Instruments	LM2596SX-5.0/NOPB	Switcher	1	\$1.80	 TS5B 199 mm ²









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	1.069 A	Current	Input capacitor RMS ripple current
2.	Cout IRMS	122.454 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	2.712 A	Current	Peak switch current in IC
4.	Iin Avg	651.25 mA	Current	Average input current
5.	L Ipp	424.19 mA	Current	Peak-to-peak inductor ripple current
6.	Q Iavg	602.29 mA	Current	Q Iavg
7.	BOM Count	5	General	Total Design BOM count
8.	FootPrint	556.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	150.0 kHz	General	Switching frequency
10.	IC Tolerance	0.0 V	General	IC Feedback Tolerance
11.	Mode	CCM	General	Conduction Mode
12.	Pout	12.5 W	General	Total output power
13.	Q Vsat Act	1.04 V	General	Q Vsat
14.	Total BOM	\$3.81	General	Total BOM Cost
15.	Cross Freq	10.0 kHz	Op_point	Bode plot crossover frequency
16.	Duty Cycle	24.092 %	Op_point	Duty cycle
17.	Efficiency	79.974 %	Op_point	Steady state efficiency
18.	IC Tj	95.991 degC	Op_point	IC junction temperature
19.	ICThetaJA	50.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
20.	IOUT_OP	2.5 A	Op_point	Iout operating point
21.	Phase Marg	49.556 deg	Op_point	Bode Plot Phase Margin
22.	VIN_OP	24.0 V	Op_point	Vin operating point
23.	Vout p-p	25.452 mV	Op_point	Peak-to-peak output ripple voltage
24.	Cin Pd	3.429 mW	Power	Input capacitor power dissipation
25.	Cout Pd	899.703 μW	Power	Output capacitor power dissipation
26.	Diode Pd	1.328 W	Power	Diode power dissipation
27.	IC Pd	1.32 W	Power	IC power dissipation
28.	L Pd	467.5 mW	Power	Inductor power dissipation
29.	Total Pd	3.13 W	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	2.5	Maximum Output Current
2.	VinMax	24.0	Maximum input voltage
3.	VinMin	20.0	Minimum input voltage
4.	Vout	5.0	Output Voltage
5.	base_pn	LM2596	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **LM2596** Product Folder : <http://www.ti.com/product/LM2596> : contains the data sheet and other resources.

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