

WEBENCH® Design Report

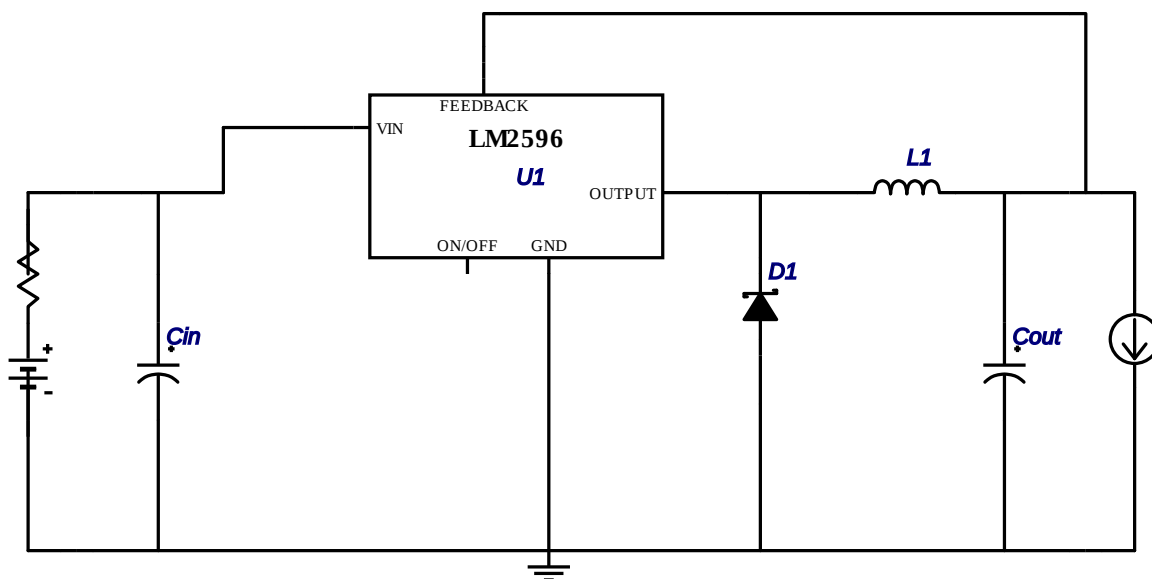
Design : 265366/14 LM2596S-5.0

Design 14 - LM2596S-5.0

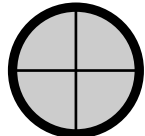
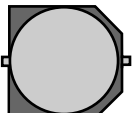
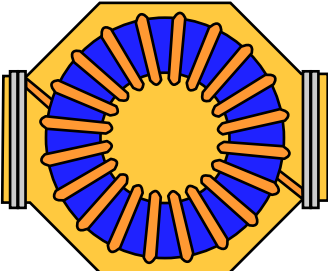
WEBENCH® Design : LM2596_5.0_Buck_None

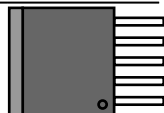
VinMin = 10.0
VinMax = 40.0
Vout = 5.0
Iout = 3.0

Device = LM2596S-5.0
Topology = Buck
Creation date = 9/28/10 7:03:03 AM
Total BOM Cost = \$4.44
Total Pd = 3.99 W
Footprint = 1,976.0 mm²
BOM Count = 7



BOM

#	Name	Manufacturer	Part Number	Qty	Price	Properties	Footprint
1.	Cin	Panasonic	EEUED2D470 Series= 286	3	\$0.29	Cap= 4.7E-5 F IRMS= 0.8 A VDC= 200 V	 CAPPR5-12.5X20 210mm ²
2.	Cout	Panasonic	EEE-FK1A102P Series= FK	1	\$0.28	Cap= 0.001 F IRMS= 0.8 A VDC= 10 V	 SM_RADIAL_G 172mm ²
3.	D1	Comchip Technology	CDBC560-G	1	\$0.25	Diode	 SMC 83mm ²
4.	L1	Bourns	PM2110-390K-RC	1	\$1.09	L= 3.9E-5 H DCR= 0 Ohm	 PM2110 890mm ²

#	Name	Manufacturer	Part Number	Qty	Price	Properties	Footprint
5.	U1	National Semiconductor	LM2596S-5.0	1	\$1.95	Switcher	 TS5B 199mm2

Op Vals

#	Name	Value	Category	Description
1.	Cin IRMS	1.056486646 A	Current	Input capacitor RMS ripple current
2.	Cout IRMS	0.242580866 A	Current	Output capacitor RMS ripple current
3.	IC Ipk	3.420162385 A	Current	Peak switch current in IC
4.	Iin Avg	0.4749 A	Current	Average input current
5.	L Ipp	0.840324769 A	Current	Peak-to-peak inductor ripple current
6.	Q Iavg	0.43518266 A	Current	Q Iavg
7.	BOM Count	7.000	General	Total Design BOM count
8.	FootPrint	1976.000 mm2	General	Total Foot Print Area of BOM components
9.	Frequency	150000.000 Hz	General	Switching frequency
10.	Mode	CCM	General	Conduction Mode
11.	Pout	15.000 W	General	Total output power
12.	Q Vsat Act	1.111472148 V	General	Q Vsat
13.	Total BOM	\$4.44	General	Total BOM Cost
14.	Cross Freq	30199.51720402 Hz	Op_point	Bode plot crossover frequency
15.	Duty Cycle	14.506088676 deg	Op_point	Duty cycle
16.	Efficiency	78.970 %	Op_point	Steady state efficiency
17.	IC Tj	116.247592933 degC	Op_point	IC junction temperature
18.	ICThetaJA	50.000 degC/W	Op_point	IC junction-to-ambient thermal resistance
19.	IOUT_OP	3.000 A	Op_point	Iout operating point
20.	Phase Marg	83.66090862 deg	Op_point	Bode Plot Phase Margin
21.	VIN_OP	40.000 V	Op_point	Vin operating point
22.	Vout p-p	0.067225982 V	Op_point	Peak-to-peak output ripple voltage
23.	Cin Pd	0.14173609 W	Power	Input capacitor power dissipation
24.	Cout Pd	0.004707638 W	Power	Output capacitor power dissipation
25.	Diode Pd	1.923613005 W	Power	Diode power dissipation
26.	IC Pd	1.724951859 W	Power	IC power dissipation
27.	L Pd	0.198 W	Power	Inductor power dissipation
28.	Total Pd	3.9948588 W	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	ErrorFeature	I	Error feature
2.	Iout	3.0 A	Maximum Output Current
3.	Iout1	3.0 Amps	Output Current #1
4.	NumOutPuts	2.0	Number of Output
5.	SoftStart	0.0 ms	Soft Start Time (ms)
6.	SyncFeature	I	External Sync feature
7.	VinMax	40.0 V	Maximum input voltage
8.	VinMin	10.0 V	Minimum input voltage
9.	Vout	5.0 V	Output Voltage
10.	Vout1	5.0 Volt	Output Voltage #1
11.	base_pn	LM2596	National Based Product Number
12.	customfreq	Y	Use Customer Frequency
13.	onOff	I	On/Off feature
14.	optfactor	3.0	Optimization factor to tune up the design
15.	pricefactor	0.0	Price factor to tune up the design cost
16.	ta	30.0 degC	Ambient temperature