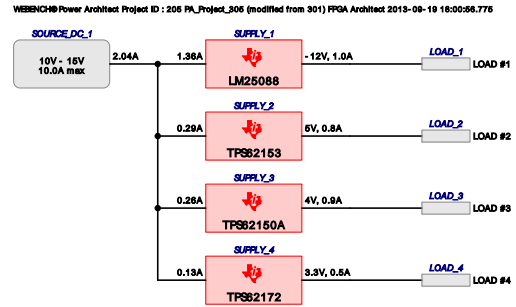


WEBENCH[®] Power Architect

Project Report

Project : 3493844/205 : PA_Project_305 (modified from 301)
 Created : 2013-09-19 18:00:56.775
 Optimize project optFactor=3



Project Summary

- | | |
|-----------------------------------|------------------------|
| 1. Total System Efficiency | 89.169 % |
| 2. Total System BOM Count | 44.0 |
| 3. Total System Footprint | 1.068 kmm ² |
| 4. Total System BOM Cost | \$6.52 |
| 5. Total System Power Dissipation | 2.581 W |

--> Launch WEBENCH Power Architect.

Power Supplies

#	Name	NSID	Description	Vout	Iout	Efficiency	Foot-print	Cost	Design	Page
1.	SUPPLY_1	LM25088	Switcher : Positive to negative inverting buck boost converter with dither	-12 V	1.0 A	88.3%	650	\$2.84	1093	4
2.	SUPPLY_2	TPS62153	Switcher : 3V-17V,5Vout,1A,Buck,DCS-Control,pin selectable frequency	5 V	0.8 A	92.2%	154	\$1.31	1094	7
3.	SUPPLY_3	TPS62150A	Switcher : 3V-17V,1A, DCS-Control, pin selectable frequency, PG low when device in shutdown through EN, UVLO or Thermal Shutdown	4 V	0.9 A	90.9%	169	\$1.33	1095	9
4.	SUPPLY_4	TPS62172	Switcher : 3V-17V,3.3Vout,0.5A,Buck Converter with Power Good	3.3 V	0.5 A	84.9%	95	\$1.04	1096	11

Power Loads

#	Name	VLoad	Iload	Description
1.	LOAD #1	-12 V	1 A	VoutRipple=10%
2.	LOAD #2	5 V	0.8 A	VoutRipple=10%
3.	LOAD #3	4 V	0.9 A	VoutRipple=10%
4.	LOAD #4	3.3 V	0.5 A	VoutRipple=10%

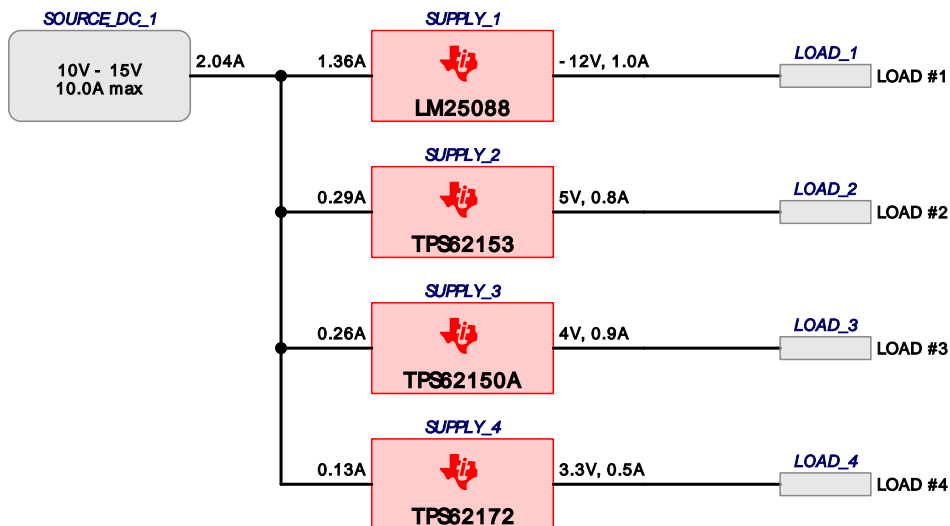
FPGAs, Processors

#	Manufacturer	Part Number	Name	Series	Description
1.	Actel	A3P015	FPGA_1	ProASIC3	FPGA Actel ProASIC3 A3P015

http://www.actel.com/documents/PA3_DS.pdf

Project Diagram

WEBENCH® Power Architect Project ID : 205_PA_Project_305 (modified from 301) FPGA Architect 2013-09-19 18:00:56.775



Electrical Procurement BOM

Manufacturer	Part Number	Description	Quantity	Budgetary Price	Footprint (mm ²)
AVX	08053C104KAT2A	0805	1	\$0.01	13
Kemet	C0603C104K3RACTU	0603	1	\$0.01	10
Kemet	C1206C105K3RACTU	1206	1	\$0.04	19
TDK	C2012X5R0J226M	0805	1	\$0.06	13
TDK	C3216X7R1H105K	1206	1	\$0.04	19
Yageo America	CC0805JRNPO9BN181	0805	1	\$0.01	13
Yageo America	CC0805KRX7R9BB562	0805	2	\$0.01	26
Vishay-Dale	CRCW0402100KFKED	0402	3	\$0.01	22
Vishay-Dale	CRCW040210K0FKED	0402	1	\$0.01	8
Vishay-Dale	CRCW040210K2FKED	0402	1	\$0.01	8
Vishay-Dale	CRCW040213K0FKED	0402	1	\$0.01	8
Vishay-Dale	CRCW040214K7FKED	0402	1	\$0.01	8
Vishay-Dale	CRCW0402178KFKED	0402	1	\$0.01	8
Vishay-Dale	CRCW04021K65FKED	0402	1	\$0.01	8
Vishay-Dale	CRCW04021K74FKED	0402	1	\$0.01	8
Vishay-Dale	CRCW0402221KFKED	0402	1	\$0.01	8
Vishay-Dale	CRCW0402715KFKED	0402	1	\$0.01	8
Nippon Chemi-Con	EMVA100ADA220MD55G	CAPSMT_62_D55	2	\$0.07	79
Fairchild Semiconductor	FDS8449	SOIC-8	1	\$0.23	55
MuRata	GRM1555C1H241JA01D	0402	1	\$0.01	8
MuRata	GRM155R61A124KE19D	0402	2	\$0.01	15
MuRata	GRM155R61A563KA01D	0402	1	\$0.01	8
MuRata	GRM155R71A393KA01D	0402	1	\$0.01	8
MuRata	GRM1885C1H242JA01D	0603	1	\$0.02	10
MuRata	GRM188R61E105KA12D	0603	1	\$0.02	10
MuRata	GRM31CR61E106KA12L	1206	3	\$0.07	56
MuRata	GRM32ER61C226KE20L	1210	1	\$0.30	23
Texas Instruments	LM25088MH-1/NOPB	MXA16A	1	\$1.25	59
Ohmite	LVK12R024FER	1206	1	\$0.27	19
Bourns	SDR0403-2R2ML	SDR0403	3	\$0.17	117
Bourns	SDR1307-120ML	SDR1307	1	\$0.34	227
Vishay-Semiconductor	SS36-E3/57T	SMC	1	\$0.18	83
Texas Instruments	TPS62150ARGTR	S-PVQFN-N16	1	\$0.98	36
Texas Instruments	TPS62153RGTR	S-PVQFN-N16	1	\$0.98	36
Texas Instruments	TPS62172DSGR	S-PWSON-N8	1	\$0.73	17
Total			44	\$6.52	1,067

















VinMin = 10.0V
 VinMax = 15.0V
 Vout = -12.0V
 Iout = 1.0A







Device = LM25088MH-1/NOPB
 Topology = Inverting_Buck_Boost
 Created = 9/19/13 6:00:02 PM
 BOM Cost = \$2.84
 Total Pd = 1.59W
 Footprint = 650.0mm2
 BOM Count = 25

WEBENCH® Design Report

Design : 3493844/1093 LM25088MH-1/NOPB
 LM25088MH-1/NOPB 10.0V-15.0V to -12.0V @ 1.0A

Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	Kemet	C0603C104K3RACTU Series= X7R	Cap= 100.0 nF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	 0603 10mm2
2.	Ccomp	MuRata	GRM1885C1H242JA01D Series= C0G/NP0	Cap= 2.4 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.02	 0603 10mm2
3.	Ccomp2	Yageo America	CC0805JRNP09BN181 Series= C0G/NP0	Cap= 180.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 13mm2
4.	Cdthr	MuRata	GRM155R71A393KA01D Series= X7R	Cap= 39.0 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	 0402 8mm2
5.	Cft	MuRata	GRM155R61A124KE19D Series= X5R	Cap= 120.0 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	 0402 8mm2
6.	Cin	Kemet	C1206C105K3RACTU Series= X7R	Cap= 1.0 µF ESR= 11.0 mOhm VDC= 25.0 V IRMS= 3.55 A	1	\$0.04	 1206 19mm2
7.	Cinx	AVX	08053C104KAT2A Series= X7R	Cap= 100.0 nF ESR= 280.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	 0805 13mm2
8.	Cio	TDK	C3216X7R1H105K Series= X7R	Cap= 1.0 µF ESR= 10.0 mOhm VDC= 50.0 V IRMS= 3.2 A	1	\$0.04	 1206 19mm2
9.	Cout	MuRata	GRM32ER61C226KE20L Series= X5R	Cap= 22.0 µF ESR= 2.0 mOhm VDC= 16.0 V IRMS= 3.68 A	1	\$0.30	 1210 23mm2
10.	Coutx	MuRata	GRM188R61E105KA12D Series= X5R	Cap= 1.0 µF VDC= 25.0 V IRMS= 0.0 A	1	\$0.02	 0603 10mm2
11.	Cramp	MuRata	GRM1555C1H241JA01D Series= C0G/NP0	Cap= 240.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0402 8mm2
12.	Css	MuRata	GRM155R61A563KA01D Series= X5R	Cap= 56.0 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	 0402 8mm2
13.	Cvcc	MuRata	GRM155R61A124KE19D Series= X5R	Cap= 120.0 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	 0402 8mm2
14.	D1	Vishay-Semiconductor	SS36-E3/57T	VF@Io= 750.0 mV VRRM= 60.0 V	1	\$0.18	 SMC 83mm2

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
15.	L1	Bourns	SDR1307-120ML	L= 12.0 μ H DCR= 30.0 mOhm	1	\$0.34	 SDR1307 227mm2
16.	M1	Fairchild Semiconductor	FDS8449	VdsMax= 40.0 V IdsMax= 7.6 Amps	1	\$0.23	 SOIC-8 55mm2
17.	Rcomp	Vishay-Dale	CRCW040213K0FKED Series= CRCW..e3	Res= 13.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 8mm2
18.	Rfbb	Vishay-Dale	CRCW04021K65FKED Series= CRCW..e3	Res= 1.65 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 8mm2
19.	Rfbt	Vishay-Dale	CRCW040214K7FKED Series= CRCW..e3	Res= 14.7 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 8mm2
20.	Rramp	Vishay-Dale	CRCW0402221KFKED Series= CRCW..e3	Res= 221.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 8mm2
21.	Rsense	Ohmite	LVK12R024FER Series= LVK12	Res= 24.0 mOhm Power= 500.0 mW Tolerance= 1.0%	1	\$0.27	 1206 19mm2
22.	Rt	Vishay-Dale	CRCW040210K2FKED Series= CRCW..e3	Res= 10.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 8mm2
23.	Ruv1	Vishay-Dale	CRCW04021K74FKED Series= CRCW..e3	Res= 1.74 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 8mm2
24.	Ruv2	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 8mm2
25.	U1	Texas Instruments	LM25088MH-1/NOPB	Switcher	1	\$1.25	 MXA16A 59mm2

Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	529.67 mA	Current	Input capacitor RMS ripple current

#	Name	Value	Category	Description
2.	Cio IRMS	429.249 mA	Current	Input to output capacitor RMS ripple current
3.	Cout IRMS	1.097 A	Current	Output capacitor RMS ripple current
4.	D1 Irms	1.179 A	Current	D1 Irms
5.	IC Ipk	8.035 mA	Current	Peak switch current in IC
6.	Iin Avg	1.359 A	Current	Average input current
7.	L Ipp	837.8 mA	Current	Peak-to-peak output inductor ripple current
8.	L1 Ipk	2.718 A	Current	Inductor peak current
9.	L1 Irms	1.569 A	Current	Inductor ripple current
10.	M1 Irms	1.035 A	Current	M1 MOSFET Irms
11.	BOM Count	25	General	Total Design BOM count
12.	FootPrint	650.0 mm2	General	Total Foot Print Area of BOM components
13.	Frequency	550.0 kHz	General	Switching frequency
14.	IC Tolerance	18.0 mV	General	IC Feedback Tolerance
15.	Total BOM	\$2.84	General	Total BOM Cost
16.	D1 Tj	83.204 degC	Op_Point	D1 junction temperature
17.	Vin p-p	314.892 mV	Op_Point	Peak-to-peak input voltage
18.	Cross Freq	14.65 kHz	Op_point	Bode plot crossover frequency
19.	Duty Cycle	56.5 %	Op_point	Duty cycle
20.	Efficiency	88.324 %	Op_point	Steady state efficiency
21.	Gain Marg	10.269 db	Op_point	Bode Plot Gain Margin
22.	IC Tj	53.177 degC	Op_point	IC junction temperature
23.	IOUT_OP	1.0 A	Op_point	Iout operating point
24.	M1 TjOP	76.198 degC	Op_point	M1 MOSFET junction temperature
25.	Phase Marg	46.667 deg	Op_point	Bode Plot Phase Margin
26.	Phase Shift	47.559 deg	Op_point	Bode Plot Phase Shift
27.	VIN_OP	10.0 V	Op_point	Vin operating point
28.	Vout p-p	62.397 mV	Op_point	Peak-to-peak output ripple voltage
29.	Cin Pd	3.086 mW	Power	Input capacitor power dissipation
30.	Cio Pd	1.843 mW	Power	Input to output capacitor power dissipation
31.	Cout Pd	2.406 mW	Power	Output capacitor power dissipation
32.	D1 Pd	785.524 mW	Power	Diode power dissipation
33.	D1 PdCond	750.0 mW	Power	Diode conduction losses
34.	D1 PdSw	35.524 mW	Power	Diode switching losses
35.	IC Pd	329.435 mW	Power	IC power dissipation
36.	L Pd	148.168 mW	Power	Inductor power dissipation
37.	M1 Pd	289.864 mW	Power	M1 MOSFET total power dissipation
38.	M1 PdCond	77.774 mW	Power	M1 MOSFET conduction losses
39.	M1 PdSw	212.09 mW	Power	M1 MOSFET switching losses
40.	Rsense Pd	48.103 mW	Power	LED Current Rsns Power Dissipation
41.	Total Pd	1.586 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	15.0 V	Maximum input voltage
4.	VinMin	10.0 V	Minimum input voltage
5.	Vout	-12.0 V	Output Voltage
6.	Vout1	-12.0 Volt	Output Voltage #1
7.	base_pn	LM25088	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	ta	40.0 degC	Ambient temperature

Design Assistance

1. LM25088 Product Folder : <http://www.ti.com/product/lm25088> : contains the data sheet and other resources.









VinMin = 10.0V
 VinMax = 15.0V
 Vout = 5.0V
 Iout = 0.8A

Device = TPS62153RGTR
 Topology = Buck
 Created = 9/19/13 6:00:18 PM
 BOM Cost = \$1.31
 Total Pd = 0.34W
 Footprint = 154.0mm2
 BOM Count = 6

WEBENCH® Design Report

Design : 3493844/1094 TPS62153RGTR
 TPS62153RGTR 10.0V-15.0V to 5.0V @ 0.8A

Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM31CR61E106KA12L Series= X5R	Cap= 10.0 µF ESR= 4.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	\$0.07	 1206 19mm2
2.	Cout	Nippon Chemi-Con	EMVA100ADA220MD55G Series= MVA	Cap= 22.0 µF VDC= 10.0 V IRMS= 26.0 mA	1	\$0.07	 CAPSMT_62_D55 40mm2
3.	Css	Kemet	C0805C332K5RACTU Series= X7R	Cap= 3.3 nF ESR= 332.0 mOhm VDC= 50.0 V IRMS= 319.0 mA	1	\$0.01	 0805 13mm2
4.	L1	Bourns	SDR0403-2R2ML	L= 2.2 µH DCR= 47.0 mOhm	1	\$0.17	 SDR0403 39mm2
5.	Rpg	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 8mm2
6.	U1	Texas Instruments	TPS62153RGTR	Switcher	1	\$0.98	 S-PVQFN-N16 36mm2

Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	379.289 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	337.322 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	1.384 A	Current	Peak switch current in IC
4.	Iin Avg	289.24 mA	Current	Average input current
5.	L Ipp	1.169 A	Current	Peak-to-peak inductor ripple current
6.	BOM Count	6	General	Total Design BOM count
7.	FootPrint	154.0 mm2	General	Total Foot Print Area of BOM components
8.	Frequency	1.327 MHz	General	Switching frequency
9.	Pout	4.0 W	General	Total output power
10.	Total BOM	\$1.31	General	Total BOM Cost
11.	Vout OP	5.0 V	Op_Point	Operational Output Voltage
12.	Duty Cycle	34.12 %	Op_point	Duty cycle
13.	Efficiency	92.197 %	Op_point	Steady state efficiency
14.	IC Tj	48.74 degC	Op_point	IC junction temperature
15.	ICThetaJA	29.1 degC/W	Op_point	IC junction-to-ambient thermal resistance
16.	IOUT_OP	800.0 mA	Op_point	Iout operating point
17.	VIN_OP	15.0 V	Op_point	Vin operating point
18.	Vout p-p	5.002 mV	Op_point	Peak-to-peak output ripple voltage

#	Name	Value	Category	Description
19.	Cin Pd	575.44 μ W	Power	Input capacitor power dissipation
20.	Cout Pd	0.0 W	Power	Output capacitor power dissipation
21.	IC Iq Pd	300.0 μ W	Power	IC Iq Pd
22.	IC Pd	300.355 mW	Power	IC power dissipation
23.	L Pd	37.6 mW	Power	Inductor power dissipation
24.	Total Pd	338.541 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	800.0 mA	Maximum Output Current
2.	Iout1	800.0 mAmps	Output Current #1
3.	VinMax	15.0 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	TPS62153	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	ta	40.0 degC	Ambient temperature

Design Assistance

1. Feature Highlights: DCS-Control(TM) Architecture with upto 1A output current, 3V to 17V Input Voltage Range, 5.0V Fixed Output voltage>Selectable operating frequency, Optional Softstart Capacitor for slow startup, Tracking,Pin selectable output voltage (nominal, +5%) Seamless Power Save Mode for Light Load Efficiency, Power Good Output, 100% Duty Cycle mode, Short Circuit Protection, Thermal Shutdown

2. TPS62153 Product Folder : <http://www.ti.com/product/tps62153> : contains the data sheet and other resources.











VinMin = 10.0V
 VinMax = 15.0V
 Vout = 4.0V
 Iout = 0.9A

Device = TPS62150ARGTR
 Topology = Buck
 Created = 9/19/13 6:00:23 PM
 BOM Cost = \$1.33
 Total Pd = 0.36W
 Footprint = 169.0mm2
 BOM Count = 8

WEBENCH® Design Report

Design : 3493844/1095 TPS62150ARGTR
 TPS62150ARGTR 10.0V-15.0V to 4.0V @ 0.9A

Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM31CR61E106KA12L Series= X5R	Cap= 10.0 µF ESR= 4.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	\$0.07	 1206 19mm2
2.	Cout	Nippon Chemi-Con	EMVA100ADA220MD55G Series= MVA	Cap= 22.0 µF VDC= 10.0 V IRMS= 26.0 mA	1	\$0.07	 CAPSMT_62_D55 40mm2
3.	Css	Kemet	C0805C332K5RACTU Series= X7R	Cap= 3.3 nF ESR= 332.0 mOhm VDC= 50.0 V IRMS= 319.0 mA	1	\$0.01	 0805 13mm2
4.	L1	Bourns	SDR0403-2R2ML	L= 2.2 µH DCR= 47.0 mOhm	1	\$0.17	 SDR0403 39mm2
5.	Rfb1	Vishay-Dale	CRCW0402178KFKED Series= CRCW..e3	Res= 178.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 8mm2
6.	Rfb2	Vishay-Dale	CRCW0402715KFKED Series= CRCW..e3	Res= 715.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 8mm2
7.	Rpg	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 8mm2
8.	U1	Texas Instruments	TPS62150ARGTR	Switcher	1	\$0.98	 S-PVQFN-N16 36mm2

Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	401.959 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	299.913 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	1.419 A	Current	Peak switch current in IC
4.	Iin Avg	264.13 mA	Current	Average input current
5.	L Ipp	1.039 A	Current	Peak-to-peak inductor ripple current
6.	BOM Count	8	General	Total Design BOM count
7.	FootPrint	169.0 mm2	General	Total Foot Print Area of BOM components
8.	Frequency	1.324 MHz	General	Switching frequency
9.	Pout	3.6 W	General	Total output power
10.	Total BOM	\$1.33	General	Total BOM Cost
11.	Vout OP	4.0 V	Op_Point	Operational Output Voltage

#	Name	Value	Category	Description
12.	Duty Cycle	27.521 %	Op_point	Duty cycle
13.	Efficiency	90.864 %	Op_point	Steady state efficiency
14.	IC Tj	49.13 degC	Op_point	IC junction temperature
15.	ICThetaJA	29.1 degC/W	Op_point	IC junction-to-ambient thermal resistance
16.	IOUT_OP	900.0 mA	Op_point	Iout operating point
17.	VIN_OP	15.0 V	Op_point	Vin operating point
18.	Vout p-p	4.457 mV	Op_point	Peak-to-peak output ripple voltage
19.	Cin Pd	646.284 µW	Power	Input capacitor power dissipation
20.	Cout Pd	0.0 W	Power	Output capacitor power dissipation
21.	IC Iq Pd	300.0 µW	Power	IC Iq Pd
22.	IC Pd	313.738 mW	Power	IC power dissipation
23.	L Pd	47.588 mW	Power	Inductor power dissipation
24.	Total Pd	361.964 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	900.0 mA	Maximum Output Current
2.	Iout1	900.0 mAmps	Output Current #1
3.	VinMax	15.0 V	Maximum input voltage
4.	VinMin	10.0 V	Minimum input voltage
5.	Vout	4.0 V	Output Voltage
6.	Vout1	4.0 Volt	Output Voltage #1
7.	base_pn	TPS62150A	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	ta	40.0 degC	Ambient temperature

Design Assistance

1. Feature Highlights: DCS-Control(TM) Architecture with upto 1A output current, 3V to 17V Input Voltage Range, Adjustable output voltage from 0.9V to 6V Selectable operating frequency, Optional Softstart Capacitor for slow startup, Tracking, Pin selectable output voltage (nominal, +5%) Seamless Power Save Mode for Light Load Efficiency, Power Good Output, 100% Duty Cycle mode, Short Circuit Protection, PG=Low when device is in shutdown through EN, UVLO or Thermal Shutdown

2. TPS62150A Product Folder : <http://www.ti.com/product/tps62150a> : contains the data sheet and other resources.








VinMin = 10.0V
 VinMax = 15.0V
 Vout = 3.3V
 Iout = 0.5A

Device = TPS62172DSGR
 Topology = Buck
 Created = 9/19/13 6:00:24 PM
 BOM Cost = \$1.04
 Total Pd = 0.29W
 Footprint = 95.0mm2
 BOM Count = 5

WEBENCH® Design Report

Design : 3493844/1096 TPS62172DSGR
 TPS62172DSGR 10.0V-15.0V to 3.3V @ 0.5A

Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM31CR61E106KA12L Series= X5R	Cap= 10.0 µF ESR= 4.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	\$0.07	 1206 19mm2
2.	Cout	TDK	C2012X5R0J226M Series= X5R	Cap= 22.0 µF ESR= 1.8 mOhm VDC= 6.3 V IRMS= 0.0 A	1	\$0.06	 0805 13mm2
3.	L1	Bourns	SDR0403-2R2ML	L= 2.2 µH DCR= 47.0 mOhm	1	\$0.17	 SDR0403 39mm2
4.	Rpg	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 8mm2
5.	U1	Texas Instruments	TPS62172DSGR	Switcher	1	\$0.73	 S-PWSON-N8 17mm2

Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	209.646 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	149.746 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	759.367 mA	Current	Peak switch current in IC
4.	Iin Avg	129.62 mA	Current	Average input current
5.	L Ipp	518.734 mA	Current	Peak-to-peak inductor ripple current
6.	BOM Count	5	General	Total Design BOM count
7.	FootPrint	95.0 mm2	General	Total Foot Print Area of BOM components
8.	Frequency	2.334 MHz	General	Switching frequency
9.	Pout	1.65 W	General	Total output power
10.	Total BOM	\$1.04	General	Total BOM Cost
11.	Vout OP	3.3 V	Op_Point	Operational Output Voltage
12.	Duty Cycle	22.761 %	Op_point	Duty cycle
13.	Efficiency	84.863 %	Op_point	Steady state efficiency
14.	IC Tj	57.268 degC	Op_point	IC junction temperature
15.	ICThetaJA	61.8 degC/W	Op_point	IC junction-to-ambient thermal resistance
16.	IOUT_OP	500.0 mA	Op_point	Iout operating point
17.	VIN_OP	15.0 V	Op_point	Vin operating point
18.	Vout p-p	2.032 mV	Op_point	Peak-to-peak output ripple voltage
19.	Cin Pd	175.806 µW	Power	Input capacitor power dissipation
20.	Cout Pd	40.363 µW	Power	Output capacitor power dissipation
21.	IC Iq Pd	525.0 µW	Power	IC Iq Pd
22.	IC Pd	279.415 mW	Power	IC power dissipation
23.	L Pd	14.688 mW	Power	Inductor power dissipation
24.	Total Pd	294.309 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	500.0 mA	Maximum Output Current
2.	Iout1	500.0 mAmps	Output Current #1
3.	VinMax	15.0 V	Maximum input voltage
4.	VinMin	10.0 V	Minimum input voltage
5.	Vout	3.3 V	Output Voltage
6.	Vout1	3.3 Volt	Output Voltage #1
7.	base_pn	TPS62172	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	ta	40.0 degC	Ambient temperature

Design Assistance

1. Feature Highlights: DCS-Control(TM) Architecture with upto 0.5A output current, 3V to 17V Input Voltage Range, 3.3V Fixed Output voltage, Seamless Power Save Mode for Light Load Efficiency, Power Good Output, 100% Duty Cycle mode, Short Circuit Protection, Thermal Shutdown

2. TPS62172 Product Folder : <http://www.ti.com/product/tps62172> : contains the data sheet and other resources.

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