

APPENDIX B – PARTS AND COST

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The parts and cost for the different modules are listed in Table B.1 through Table B.8. Each table includes a description, use, manufacturer's part number, unit cost, and total cost of the modules. Table B.8 list the cost of each modules and the total cost of project.

Table B.1 – Parts and Cost for the Rectifier Circuit

Part	Part Description	Manufacture Part Number	Unit Cost	Qty .	Total Cost
Rectifier Bridge	RECT BRIDGE GPP 6A 400V GBU	GBU6G-BPMS-ND	\$1.40	1	\$1.40
Subcomponent Total					\$1.40

Table B.2 – Parts and Cost for Linear Regulator Circuit

Part	Part Description	Manufacture Part Number	Unit Cost	Qty.	Total Cost
125V-12V Linear Regulator	IC REG ADJ HI-VOLT D2PAK-3	296-20778-1-ND	\$2.55	3	\$7.65
82 Ω Resistor	RES 82 OHM 1/4W 5% 1206 SMD	P82ECT-ND	\$0.06	3	\$0.18
Potentiometer Resistor			\$2.56	3	\$7.68
1 μ F Decoupling Capacitance	CAP CER 1UF 25V 20% X7R 1206	445-4024-1-ND	\$0.42	3	\$1.26
10 μ F Output Capacitor	CAP CER 10UF 16V 20% X7R 1206	445-1601-1-ND	\$0.37	3	\$1.11
Subcomponent Total					\$17.88

Table B.3 – Parts and Cost for Flyback Circuit

Part	Part Description	Manufacture Part Number	Unit Cost	Qty.	Total Cost
Flyback Coupled Inductor Core	36/22 Ferrite Core	P36/22-3F3-E400	\$1.50	1	\$1.50
Primary Inductor Winding	Coupled Inductor Primary Windings	-	\$3.00	1	\$3.00
Secondary Inductor Winding	Coupled Inductor Secondary Windings	-	\$3.00	1	\$3.00
Flyback Diode	DIODE SCHOTTKY 30V 40A D2PAK	MBRB4030T4GOS CT-ND	\$3.31	1	\$3.31
10mF Flyback Output Capacitance	CAP CER 10mF 25V 10% X8R 0603	581-06033F103KAT2A	\$0.04	2	\$0.08

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Table B.3 – Parts and Cost For Flyback Circuit (Continue)

Part	Part Description	Manufacture Part Number	Unit Cost	Qty.	Total Cost
Flyback Output Capacitance 3300μF	CAP ALUM 3300μF 35V 20% RADIAL	P5171-ND	\$1.55	1	\$1.55
Flyback MOSFET	MOSFET N-CH 200V 31A D2PAK	FQB34N20LTMCT-ND	\$2.37	1	\$2.37
Snubber Diode	DIODE SCHOTTKY 60V 1A SOD123	MBRX160TPMSCT-ND	\$0.44	1	\$0.44
Snubber Capacitance	CAP CER 1UF 25V 20% X7R 1206	445-4024-1-ND	\$0.42	1	\$0.42
Snubber Resistor	RES 50 OHM 20W 5% 1206 SMD	CHF1206CNT500LW-ND	\$0.43	1	\$0.43
Heatsink			\$0.10	1	\$0.10
Flyback HS Gate Driver	IC MOSFET DRIVER 1CHAN 8SOIC	IR2117SPBF-ND	\$3.25	1	\$3.25
Bootstrap Capacitor	CAP CER 1UF 50V 10% X7R 1206	PCC2478CT-ND	\$0.79	2	\$1.58
Bootstrap Diode	DIODE SCHOTTKY 60V 1A SOD123	MBRX160TPMSCT-ND	\$0.44	1	\$0.44
Gare Current Limiting Resistor	RESISTOR 2.7 OHM 1/4W 5% 1206	P2.7ECT-ND	\$0.06	1	\$0.06
Input Decoupling Capacitance	CAP CER 10UF 35V 20% X7R 1206	445-8034-1-ND	\$0.88	1	\$0.88
PWM Controller	IC CTRLR PWM CURR-MODE HP 8-SOIC	497-3681-1-ND	\$0.94	1	\$0.94
Trim Resistor	TRIMMER 500 OHM 0.5W TH	3296W-501LF-ND	\$2.56	1	\$2.56
Trim Resistor	TRIMMER 25K OHM 0.5W TH	3296W-253LF-ND	\$2.56	1	\$2.56
68Ω Resistor	RES 68 OHM 1/4W 5% 1206 SMD	P68ECT-ND	\$0.06	1	\$0.06
1kΩ Resistor	RES 1.0K OHM 1/4W 5% 1206 SMD	P1.0KECT-ND	\$0.06	1	\$0.06
2kΩ Resistor	RES 2.0K OHM 1/4W 5% 1206 SMD	P2.0KECT-ND	\$0.06	2	\$0.12
12kΩ Resistor	RES 12K OHM 1/4W 5% 1206 SMD	P12KECT-ND	\$0.06	1	\$0.06
68kΩ Resistor	RES 68K OHM 1/4W 5% 1206 SMD	P68KECT-ND	\$0.06	1	\$0.06
1μF Decoupling Capacitance	CAP CER 1UF 25V 20% X7R 1206	445-4024-1-ND	\$0.42	1	\$0.42
4700 pF Set point Capacitance	CAP CER 4700PF 50V 10% X7R 1206	311-1173-1-ND	\$0.13	1	\$0.13
Subcomponent Total					\$29.38

Table B.4 – Parts and Cost For Low Buck Circuit

Part	Part Description	Manufacture Part Number	Unit Cost	Qty.	Total Cost
Low Power Buck Converter	IC BUCK ADJ 5A 8SO	296-23750-1-ND	\$7.00	1	\$7.00
Input Decoupling Capacitance	CAP CER 10UF 35V 20% X7R 1206	445-8034-1-ND	\$0.88	1	\$0.88
Bootstrap Capacitor	CAP CER 10000PF 50V 10% X7R 1206	490-1774-1-ND	\$0.09	1	\$0.09
Low Side Switch	DIODE SCHOTTKY 30V 40A D2PAK	MBRB4030T4GOSCT-ND	\$3.31	1	\$3.31
VSENSE Divider Top	RES 10.0K OHM 1/4W 1% 1206 SMD	P10.0KFCT-ND	\$0.06	1	\$0.06
VSENSE Divider Bottom	TRIMMER 5K OHM 0.5W	3296W-502LF-ND	\$2.56	1	\$2.56
Low Buck Output Capacitance	CAP ALUM 3300UF 35V 20% RADIAL	P5171-ND	\$1.55		\$0.00
Low Buck Output Capacitance	CAP CER 10MF 25V 10% X8R 0603	581-06033F103KAT2A	\$0.04	2	\$0.08
Low Buck Inductor	SER2918H-333 Inductor	SER2918H-333	\$2.02	1	\$2.02
Subcomponent Total					\$16.00

Table B.5 – Parts and Cost For High Buck Circuit

Part	Part Description	Manufacture Part Number	Unit Cost	Qty.	Total Cost
Flyback HS Gate Driver	IC MOSFET DRIVER 1CHAN 8SOIC	IR2117SPBF-ND	\$3.25	1	\$3.25
Bootstrap Capacitor	CAP CER 1UF 50V 10% X7R 1206	PCC2478CT-ND	\$0.79	2	\$1.58
Bootstrap Diode	DIODE SCHOTTKY 60V 1A SOD123	MBRX160TPMSCT-ND	\$0.44	1	\$0.44
Gare Current Limiting Resistor	RESISTOR 2.7 OHM 1/4W 5% 1206	P2.7ECT-ND	\$0.06	1	\$0.06
Input Decoupling Capacitance	CAP CER 10UF 35V 20% X7R 1206	445-8034-1-ND	\$0.88	1	\$0.88
PWM Controller	IC CTRLR PWM CURR-MODE HP 8-SOIC	497-3681-1-ND	\$0.94	1	\$0.94
Trim Resistor	TRIMMER 500 OHM 0.5W TH	3296W-501LF-ND	\$2.56	1	\$2.56
Trim Resistor	TRIMMER 25K OHM 0.5W TH	3296W-253LF-ND	\$2.56	1	\$2.56
68Ω Resistor	RES 68 OHM 1/4W 5% 1206 SMD	P68ECT-ND	\$0.06	1	\$0.06

Table B.5 – Parts and Cost For High Buck Circuit (Continued)

Part	Part Description	Manufacture Part Number	Unit Cost	Qty.	Total Cost
1kΩ Resistor	RES 1.0K OHM 1/4W 5% 1206 SMD	P1.0KECT-ND	\$0.06	1	\$0.06
2kΩ Resistor	RES 2.0K OHM 1/4W 5% 1206 SMD	P2.0KECT-ND	\$0.06	2	\$0.12
12kΩ Resistor	RES 12K OHM 1/4W 5% 1206 SMD	P12KECT-ND	\$0.06	1	\$0.06
68kΩ Resistor	RES 68K OHM 1/4W 5% 1206 SMD	P68KECT-ND	\$0.06	1	\$0.06
1μF Decoupling Capacitance	CAP CER 1UF 25V 20% X7R 1206	445-4024-1-ND	\$0.42	1	\$0.42
4700 pF Set point Capacitance	CAP CER 4700PF 50V 10% X7R 1206	311-1173-1-ND	\$0.13	1	\$0.13
High Buck Inductor	SER2918H-333 Inductor	SER2918H-333	\$2.02	1	\$2.02
High Buck Diode	DIODE SCHOTTKY 30V 40A D2PAK	MBRB4030T4GOSCT-ND	\$3.31	1	\$3.31
High Buck Output Capacitance	CAP ALUM 3300UF 35V 20% RADIAL	P5171-ND	\$1.55	1	\$1.55
High Buck MOSFET	MOSFET N-CH 200V 31A D2PAK	FQB34N20LTMCT-ND	\$2.37	1	\$2.37
Subcomponents Total					\$22.43

Table B.6 – Parts and Cost For Output Components

Part	Part Description	Manufacture Part Number	Unit Cost	Qty.	Total Cost
CONN RCPT USB 3.0 STD A BLUE	Female USB Connector	A101494-ND	\$1.81	2	\$3.62
USB 3.0 CONN TYPE A R/A PLUG SMT	Male USB Connector	GSB316441CEUC T-ND	\$2.68	2	\$5.36
Banana Plugs Female	Banana Plugs Female		\$1.00	4	\$4.00
Banana Plugs Male	Banana Plugs Male		\$1.00	4	\$4.00
AC Outlet	AC Outlet		\$1.00	1	\$1.00
Subcomponents					\$17.98

Table B.7 – Parts and Cost For Packaging and Other Material

Part	Part Description	Unit Cost	Qty.	Total Cost
PCB	PCB	\$33.00	2	\$66.00
Wall outlet box	Wall outlet box	\$2.00	1	\$2.00
Faceplate	Faceplate	\$1.00	1	\$1.00
2x4	2x4	\$2.02	1	\$2.02
Drywall	Drywall	\$5.19	1	\$5.19
Conduit	Conduit	\$2.00	1	\$2.00
Electrical tape	Electrical tape	\$3.00	1	\$3.00
Breadboard	Breadboard	\$3.00	1	\$3.00
Wire kit	Wire kit	\$3.00	1	\$3.00
Test Points	Test Points	\$0.50	10	\$5.00
Subcomponents				\$92.21

Table B.8 – Total Cost of Products

Subcomponent	Unit Cost
Rectifier Bridge	\$1.40
Linear Regulator	\$17.88
Flyback Circuit	\$29.38
Low Buck Circuit	\$16.00
High Buck Circuit	\$22.43
Output Ports	\$17.98
Packaging and Other Components	\$92.21
Product Total Cost	\$197.28