

Project: OBC_LLC_switch_board.PrjPcb

Source Data From: OBC_LLC_switch_board.PrjPcb
Project: OBC_LLC_switch_board.PrjPcb
Variant: standard_board

Bill of Materials



#	Designator	Comment	Description	LibRef	SourceLibraryName	Manufacturer	Manufacturer Part Number	Supplier	Supplier Part Number	Supplier 2	Supplier Part Number 2	Quantity
1,	C1, C2, C4, C5, C6, C7, C10, C11	220 pF	MLC capacitor 220pF 50V X7R 10% Murata	GRM188R71H221KA01D	capacitors.SVNDblib	Murata	GRM188R71H221KA01D	Digi-Key	490-1483-1-ND	Mouser	81-GRM39X221K50D	8
2,	C3, C8, C9, C33, C34, C35	100 nF	MLC capacitor 100nF 25V X7R 10% Murata	GRM219B71E104KA01D	capacitors.SVNDblib	Murata	GRM219B71E104KA01D	Digi-Key	490-12754-1-ND	Mouser	81-GRM219B71E104KA1D	6
3,	C12, C13, C18, C19, C20, C21, C26, C27	100 µF	Polymer ALU elco 100µF 35V 30mOhm 20% Würth Elektronik	875115652007	capacitors.SVNDblib	Würth Elektronik	875115652007	Würth Elektronik	875115652007			8
4,	C14, C15, C22, C23	68 µF	ALU electrolyte low impedance 68µF 35V 400mOhm 20% Würth Elektronik	865080545011	capacitors.SVNDblib	Würth Elektronik	865080545011	Digi-Key	732-8510-1-ND	Mouser	710-865080545011	4
5,	C16, C17, C24, C25	4µF	MLC capacitor 4µF 100V X7R 10% soft termination Murata	GRJ320C72A4475KE11L	capacitors.SVNDblib	Murata	GRJ320C72A4475KE11L	Digi-Key	490-10955-1-ND	Mouser	81-GRJ320C72A4475KE11L	2
6,	C28, C30	15 µF	ALU electrolyte tone life 15µF 450V 20% Würth Elektronik	865061463005	capacitors.SVNDblib	Würth Elektronik	865061463005	Würth Elektronik	865061463005			2
7,	C29	1µ	MKP film X1 capacitor 1µ 530Vac TDK	832914A5105M	capacitors.SVNDblib	TDK	832914A5105M	Digi-Key	832914A5105M000	Mouser	871-832914A5105M	1
8,	C31	27 pF	MLC capacitor 27pF 1000V COG 5% Murata	GRM31ASC3A270W001	capacitors.SVNDblib	Murata	GRM31ASC3A270W001	Digi-Key	490-11628-1-ND	Mouser	81-GRM31ASC3A270W01D	1
9,	C32, C33, C34	330 µF	Polymer ALU elco 330µF 35V 20mOhm 20% Würth Elektronik	875075661010	capacitors.SVNDblib	Würth Elektronik	875075661010	Würth Elektronik	875075661010			3
10,	C36	68 µF	MLC capacitor 68µF 250V COG 5% Murata	GRM21ASC3C680W01D	capacitors.SVNDblib	Murata	GRM21ASC3C680W01D	Digi-Key	490-1540-1-ND	Mouser	81-GRM21ASC3C680W01D	1
11,	C36	100 µF	MLC capacitor 100µF 200V COG 5% Murata	GRM21ASC2D101W01D	capacitors.SVNDblib	Murata	GRM21ASC2D101W01D	Mouser	81-GRM21ASC2D101W1D	Murata	GRM21ASC2D101W01D	1
12,	C37	100 nF	MLC capacitor 100nF 50V X7R 10% Murata	GRM218B71E104KA01L	capacitors.SVNDblib	Murata	GRM218B71E104KA01L	Digi-Key	490-1666-1-ND	Mouser	81-GRM218B71E104KA01L	1
13,	C38, C44	10 µF	ALU electrolyte low impedance 10µF 35V 2.60m 20% Würth Elektronik	865080540004	capacitors.SVNDblib	Würth Elektronik	865080540004	Digi-Key	732-8503-1-ND	Mouser	710-865080540004	2
14,	C40	6n8	MLC capacitor 6n8 50V COG 5% Murata	GRM219SC3H680JA01D	capacitors.SVNDblib	Murata	GRM219SC3H680JA01D	Digi-Key	490-1638-1-ND	Mouser	81-GRM219SC3H680JA01	1
15,	C41	220 pF	MLC capacitor 220pF 50V COG 5% Murata	GRM21ASC2D121JA01D	capacitors.SVNDblib	Murata	GRM21ASC2D121JA01D	Digi-Key	490-1616-1-ND	Mouser	81-GRM21ASC2D121D	1
16,	C42	180 pF	MLC capacitor 180pF 50V COG 5% Murata	GRM188SC3H181JA01D	capacitors.SVNDblib	Murata	GRM188SC3H181JA01D	Digi-Key	490-1433-1-ND	Mouser	81-GRM39C181J50	1
17,	C43	33 nF	MLC capacitor 33nF 25V X7R 10% Murata	GRM188B71E33KA01D	capacitors.SVNDblib	Murata	GRM188B71E33KA01D	Digi-Key	490-1521-1-ND	Mouser	81-GRM39X333K25D	1
18,	C45, C47, C48, C50	100 nF	MLC capacitor 100nF 16V X7R 20% Murata	GRM188B71C104MA01D	capacitors.SVNDblib	Murata	GRM188B71C104MA01D	Digi-Key	490-11510-1-ND	Mouser	81-GRM188B71C104MA01D	1
19,	C46, C51	10 nF	MLC capacitor 10nF 25V X7R 20% Murata	GRM218B71E103MA01D	capacitors.SVNDblib	Murata	GRM218B71E103MA01D	Mouser	81-GRM21871E103MA01D	Murata	GRM218B71E103MA01D	2
20,	C49	10 nF	MLC capacitor 2n2 25V X7R 10% Murata	GRM218B71E22KA01D	capacitors.SVNDblib	Murata	GRM218B71E22KA01D	Murata	GRM218B71E22KA01D			1
21,	C52, C60	100 nF	MLC capacitor 100nF 16V X7R 20% Murata	GRM188B71C104MA01L	capacitors.SVNDblib	Murata	GRM218B71C104MA01L	Murata	GRM218B71C104MA01L			2
22,	C56, C57, C58, C59	47 pF	MLC capacitor 47pF 50V COG 5% Murata	GRM188SC3H470JA01D	capacitors.SVNDblib	Murata	GRM188SC3H470JA01D	Digi-Key	490-1419-1-ND	Mouser	81-GRM39C470J50	1
23,	C61	10 µF	MLC capacitor 10µF 25V XSR 20% Murata	GRM218B61E106MA37L	capacitors.SVNDblib	Murata	GRM218B61E106MA37L	Digi-Key	490-10748-1-ND	Mouser	81-GRM218B61E106MA3L	1
24,	C62	4n7	MLC capacitor 4n7 25V X7R 20% Murata	GRM218B71E47MA01D	capacitors.SVNDblib	Murata	GRM218B71E47MA01D	Murata	GRM218B71E47MA01D			1
25,	C_IH, C_IL, CO1H, CO1L, CO2H, CO2L	470 µF	ALU electrolyte high current ripple 470µF 450V 20% United Chemicon	E92X451VSN471MAS0T	capacitors.SVNDblib	United Chemicon	E92X451VSN471MAS0T	Mouser	661-E92X451SN471MA50			6
26,	CHA, CHB	250 nF	Ceralink SMD capacitor 250nF 900V TDK	8B80319925AM062	capacitors.SVNDblib	TDK	8B80319925AM062	Digi-Key	495-75427-1-ND	Mouser	871-8B80319925AM062	2
27,	CP1	Cold plate 180-10-12C modified for OBC LLC	Cold plate 180-10-12C from Wakefield-Vette modified for OBC LLC project	180_10_12C_mod.01	specials.SVNDblib			Digi-Key	345-1165-ND	Mouser	567-180-10-12C	1
28,	CP DCInA, CP DCInB	171825-0100	Crimp female terminal for wires AWG 12-10 Molex	171825-0100	connectors.SVNDblib	Molex	171825-0100	Digi-Key	WM12411CT-ND	Mouser	538-171825-0100	2
29,	CTRL1	Arduino Due board	Arduino Due board	MOD_Arduino_Due	specials.SVNDblib			Digi-Key	A000062		1050-1049-ND	1
30,	D1, D3, D4, D5	RED	SMD LED diode 30 mA RED D603 Würth Elektronik	1500608575000	diodes.SVNDblib	Würth Elektronik	1500608575000	Digi-Key	732-4978-1-ND	Mouser	710-1500608575000	4
31,	D2	SUPER RED	SMD LED diode 30 mA SUPER RED D603 Würth Elektronik	1500608575000	diodes.SVNDblib	Würth Elektronik	1500608575000	Digi-Key	732-4979-1-ND	Mouser	710-1500608575000	1
32,	D6	SMB15CA	TVS 15V 600W SMB bidirectional ON Semiconductor	SMB15CA	diodes.SVNDblib	ON Semiconductor	SMB15CA	Digi-Key	SMB15CA1FCT-ND	Mouser	512-SMB15CA	1
33,	D7, D8	US1MFA	Super Fast diode 100V 1 A 75 ns SOD123FA ON Semiconductor	US1MFA	diodes.SVNDblib	ON Semiconductor	US1MFA	Digi-Key	US1MFACT-ND	Mouser	512-US1MFA	2
34,	D9	BA516H	Switching diode 100V 200mA SOD323 ON Semiconductor	BA516H1G	diodes.SVNDblib	ON Semiconductor	BA516H1G	Farnell	2453765	Mouser	863-BA516H1G	1
35,	D10	MMSZ12	Zener diode 12 V 500 mW SOD123 ON Semiconductor	MMSZ121G	diodes.SVNDblib	ON Semiconductor	MMSZ121G	Digi-Key	MMSZ1211G05CT-ND	Mouser	863-MMSZ121G	1
36,	D11, D13	MURA120	Ultra Fast diode 200 V 1 A SMA ON Semiconductor	MURA120J30	diodes.SVNDblib	ON Semiconductor	MURA120J30	Farnell	1459147	Mouser	863-MURA120J30	2
37,	D12, D16, D17, D18	GREEN	SMD LED diode 30 mA GREEN D603 Würth Elektronik	1500608575000	diodes.SVNDblib	Würth Elektronik	1500608575000	Digi-Key	732-4971-1-ND	Mouser	710-1500608575000	4
38,	D14, D15	BLUE	SMD LED diode 30 mA BLUE D603 Würth Elektronik	1500608575000	diodes.SVNDblib	Würth Elektronik	1500608575000	Digi-Key	732-4966-1-ND	Mouser	710-1500608575000	2
39,	D SEC1, D SEC2, D SEC3, D SEC4	FF3H3065B, F085	SIC Schottky diode 650V 30A ON Semiconductor	FF3H3065B, F085	diodes.SVNDblib	ON Semiconductor	FF3H3065B, F085	Digi-Key	FF3H3065B, F085	Mouser	863-FF3H3065B, F085	4
40,	DRV_AH, DRV_AL, DRV_BH, DRV_BL	SIC MOSFET driver board with NCV51705	SIC MOSFET driver board with NCV51075 ON Semiconductor	MOD_ON_SIC_driver_board	specials.SVNDblib	ON Semiconductor	NCV51705	ON Semiconductor	SEC department / BU		NCV51705	4
41,	HS1	modified MC33278 for OBC LLC	Heatsink Multicomp MC33278 42x20x23.7 - modified for OBC LLC project	MC33278_mod.02	specials.SVNDblib			Farnell	1710623			1
42,	HS2	577202 heatsink for T0220	Heatsink AAVID 577202 19.05mm 24.4°C/W AAVID	577202000000	specials.SVNDblib			Digi-Key	HS107-ND	Mouser	532-577202800	1
43,	J ADCH, J ADCL, J COMM, J POWER, J PWMH, J_AH_CTRL, J_AL_CTRL, J_BH_CTRL, J_BL_CTRL	613 008 111 21	Board-To-Board Connector, Vertical, 2.54 mm, 8 Contacts, Header, WR-PHD Series, Through Hole	61300811121	connectors.SVNDblib	Würth Elektronik	61300811121	Würth Elektronik	61300811121	Farnell	61300811121	5
44,	J_AH_CTRL, J_AL_CTRL, J_BH_CTRL, J_BL_CTRL	TSW-106-14-G-S	Header 1+6 pins PTH SAMTEC 320 mil pin	TSW-106-14-G-S	connectors.SVNDblib	Samtec	TSW-106-14-G-S	Farnell	2037181	Digi-Key	SAM1053-06-ND	4
45,	J_AH_PS, J_AL_PS, J_BH_PS, J_BL_PS	613 003 111 21	PTH vertical male header 3 pins 2.54 mm pitch Würth Elektronik	61300311121	connectors.SVNDblib	Würth Elektronik	61300311121	Digi-Key	732-5316-ND	Mouser	710-61300311121	4
46,	J_CAN, J_DAH_A, J_DAH_C, J_DAL_A, J_DAL_C, J_DBL_A, J_DBL_C, J_DS1A, J_DS1C, J_DS2A, J_DS2C, J_DS3A, J_DS3C, J_DS4A, J_DS4C, J_OAH_D, J_OAH_G, J_OAH_S, J_OAL_D, J_OAL_G, J_OAL_S, J_OBH_D, J_OBH_G, J_OBH_S, J_OBL_D, J_OBL_G, J_OBL_S	618 009 211 721	069 right angle PTH male Würth Elektronik	618009211721	connectors.SVNDblib	Würth Elektronik	618009211721	Würth Elektronik	618009211721	Farnell	282767	1
47,	J_DAH_A, J_DAH_C, J_DAL_A, J_DAL_C, J_DBL_A, J_DBL_C, J_DS1A, J_DS1C, J_DS2A, J_DS2C, J_DS3A, J_DS3C, J_DS4A, J_DS4C, J_OAH_D, J_OAH_G, J_OAH_S, J_OAL_D, J_OAL_G, J_OAL_S, J_OBH_D, J_OBH_G, J_OBH_S, J_OBL_D, J_OBL_G, J_OBL_S	19.28.177	PC Quick-Fit Terminal 2.8x0.8mm/90° Brass, tinned Ettinger	19.28.177	connectors.SVNDblib	Ettinger	19.28.177	Ettinger	19.28.177			28
48,	J_DCIN	46007-3102	PCB right angle connector 2 pins 7.49 mm pitch Molex	460073102	connectors.SVNDblib	Molex	460073102	Digi-Key	WM9558-ND	Mouser	538-46007-3102	1
49,	J_DCIN	44441-2002	Molex Sabre receptacle 2 positions 7.5 mm	44441-2002	connectors.SVNDblib	Molex	44441-2002	Digi-Key	WM18463-ND	Mouser	538-44441-2002	1
50,	J_DCNEG, J_DCPOS, J_SEC1, J_SEC2, J_SWA, J_SWB	746 550 95	Redcube terminal 10x10mm screw 5mm Würth Elektronik	74655095	connectors.SVNDblib	Würth Elektronik	74655095	Würth Elektronik	74655095	Digi-Key	732-10903-1-ND	6
51,	J_DRV_AHD, J_DRV_AHG, J_DRV_AHS, J_DRV_ALD, J_DRV_ALG, J_DRV_ALS, J_DRV_BHD, J_DRV_BHG, J_DRV_BHS, J_DRV_BLD, J_DRV_BLG, J_DRV_BLS	13.14.449	Solder Terminal Pin ø1.3x15.5mm, Ettinger	13.14.449	connectors.SVNDblib	Ettinger	13.14.449	Ettinger	13.14.449			12
52,	J_FAN	43045-0427	PCB vertical connector 4 pins 3.00 mm pitch Molex	430450427	connectors.SVNDblib	Molex	430450427	Digi-Key	WM10667-ND	Mouser	538-43045-0427	1
53,	J_PSU	691313510002	PCB right angle connector 2 pins 5.08 mm pitch Würth Elektronik	691313510002	connectors.SVNDblib	Würth Elektronik	691313510002	Farnell	1641993	Mouser	710-691313510002	1
54,	J_PSWA	691351500002	Cable connector series 351 2pins 5.08 mm Würth Elektronik	691351500002	connectors.SVNDblib	Würth Elektronik	691351500002	Würth Elektronik	691351500002			1
55,	J_PWWH	613 010 111 21	Board-To-Board Connector, 2.54 mm, 10 Contacts, Header, WR-PHD Series, Through Hole, 1 Rows	61301011121	connectors.SVNDblib	Würth Elektronik	61301011121	Würth Elektronik	61301011121	Farnell	61301011121	1
56,	J_XIO	613 036 211 21	Board-To-Board Connector, Vertical, 2.54 mm, 36 Contacts, Header, WR-PHD Series, Through Hole	61303621121	connectors.SVNDblib	Würth Elektronik	61303621121	Würth Elektronik	61303621121	Farnell	61303621121	1

#	Designator	Comment	Description	LibRef	SourceLibraryName	Manufacturer	Manufacturer Part Number	Supplier	Supplier Part Number	Supplier 2	Supplier Part Number 2	Quantity
57,	L1, L2, L3, L4	22 uH	WE TPC power inductor SMD 22uH 0.025A Würth Elektronik	74404320	inductors.SVNDblb	Würth Elektronik	744043220	Farnell	1635848	Mouser	710-744043220	4
58,	L5	100 uH	WE FPD power inductor SMD 100uH 1.5 A Würth Elektronik	744774301	inductors.SVNDblb	Würth Elektronik	744774301	Digi-Key	732-2988-1-ND	Mouser	710-744774301	1
59,	NQ1, NQ4	hex nut M3 DIN934	Hex nut M3 DIN934 ISO4032	M3_010804	specials.SVNDblb							2
60,	O1, O2, O3	SFH615A-3	Optocoupler, high reliability, 5300Vrms Vishay	SFH615A-3000T7	transistors.SVNDblb	Vishay	SFH615A-3X00T7	Digi-Key	SFH615A-3X00T7-ND	Mouser	782-SFH615A-3X00T7	3
61,	PAH, PAL, PBH, PBL	QA01C	Insulated DC-DC converter for IGBT drivers 15V->20V/-4V low capacity Mornsun	QA01C	specials.SVNDblb			Mornsun	QA01C			4
62,	Q1, Q2, Q5	FQFP5N90	NMOS 900V 3A 2.3R ON Semiconductor	FQFP5N90	transistors.SVNDblb	ON Semiconductor	FQFP5N90	Digi-Key	FQFP5N90-ND	Mouser	512-FQFP5N90	3
63,	Q3	B5S138L	NMOS 50V 0.2A 200mA 3.5Ohm ON Semiconductor	B5S138L1G	transistors.SVNDblb	ON Semiconductor	B5S138L1G	Digi-Key	B5S138L1GOSCT-ND	Mouser	863-B5S138L1G	1
64,	Q4	FDPF27J07	NMOS 250V 25A 42 SmOhm ON Semiconductor	FDPF27J07	transistors.SVNDblb	ON Semiconductor	FDPF27J07	Digi-Key	FDPF27J07-ND	Mouser	512-FDPF27J07	1
65,	MM15T580A1TG		high current surface mount PNP silicon switching transistor	MM15T580A1TG	transistors.SVNDblb	ON Semiconductor	MM15T580A1TG	Digi-Key	MM15T580A1TGOSCT-ND	Mouser	863-MM15T580A1TG	1
66,	Q7, Q10	TL431ACDG	Voltage reference 2.5V 1mA ON Semiconductor	TL431ACDG	ics.SVNDblb	ON Semiconductor	TL431ACDG	Digi-Key	TL431ACDR2GOSCT-ND	Mouser	863-TL431ACDG	2
67,	Q8, Q9	NCV33ASN2T1G	Single low noise zero drift OPAMP ON Semiconductor	NCV33ASN2T1G	ics.SVNDblb	ON Semiconductor	NCV33ASN2T1G	Digi-Key	NCV33ASN2T1G-ND	Mouser	863-NCV33ASN2T1G	2
68,	QA4H, QAL, QBH, OBL	NTW080N125C1	SiC NMOS 1200V 36A 80mOhm ON Semiconductor	NTW080N125C1	transistors.SVNDblb	ON Semiconductor	NTW080N125C1	ON Semiconductor	samples only			4
69,	R13, R55, R73, R83	82k	SMD thick film resistor 82k 1206 1% 660 mW Panasonic	ERJ6PFB820V	resistors.SVNDblb	Panasonic	ERJ6PFB820V	Mouser	667-ERJ-P08F820V	Arrow	ERJ-P08F820V	8
70,	R5, R11, R12, R19, R20, R27, R28, R34, R35, R93, R94	100k	SMD thick film resistor 100k 0603 1% 100 mW Panasonic	ERJ6KF1003V	resistors.SVNDblb	Panasonic	ERJ6KF1003V	Digi-Key	P100KHCT-ND	Mouser	667-ERJ-3EFK1003V	11
71,	R6, R14, R22, R29, R91, R92	10k	SMD thick film resistor 10k 0603 1% 100 mW Panasonic	ERJ6KF1002V	resistors.SVNDblb	Panasonic	ERJ6KF1002V	Digi-Key	P10.0KHCT-ND	Mouser	667-ERJ-3EFK1002V	10
72,	R7, R9, R15, R17, R23, R25, R30, R32, R115, R116	33R	SMD thick film resistor 33R 0603 1% 100 mW Panasonic	ERJ6KF33R0V	resistors.SVNDblb	Panasonic	2303016	Farnell	2303016	Mouser	667-ERJ-3EFK33R0V	6
73,	R8, R16, R24, R31, R95, R96	2k2	SMD thick film resistor 2k2 0603 1% 100 mW Panasonic	ERJ6KF2201V	resistors.SVNDblb	Panasonic	ERJ6KF2201V	Farnell	2303166	Mouser	667-ERJ-3EFK2201V	6
74,	R10, R18, R21, R26, R33, R97, R98, R99, R100, R101, R102	10R	SMD thick film resistor 10R 0603 1% 100 mW Panasonic	ERJ6KF10R0V	resistors.SVNDblb	Panasonic	ERJ6KF10R0V	Farnell	2302958	Mouser	667-ERJ-3EFK10R0V	11
75,	R13, R55, R73, R83	2k2	SMD thick film resistor 2k2 0805 1% 125 mW Panasonic	ERJ6ENF2201V	resistors.SVNDblb	Panasonic	ERJ6ENF2201V	Digi-Key	P2.20KCT-ND	Mouser	667-ERJ-6ENF2201V	4
76,	R36, R38, R39, R41, R44, R53, R71, R72, R74, R78, R79, R80, R81	820k	SMD thick film resistor 820k 1206 1% 660 mW Panasonic	ERJ6PFB820V	resistors.SVNDblb	Panasonic	ERJ6PFB820V	Mouser	667-ERJ-P08F820V	Arrow	ERJ-P08F820V	13
77,	R37	82R	SMD thick film resistor 82R 0805 2A Panasonic	ERJ6GEY080V	resistors.SVNDblb	Panasonic	ERJ6GEY080V	Farnell	2057661	Mouser	667-ERJ-6GEY080V	1
78,	R40, R42	47R	SMD thick film resistor 47R 1206 1% 660 mW Panasonic	ERJ6PFB47R0V	resistors.SVNDblb	Panasonic	ERJ6PFB47R0V	Mouser	667-ERJ-P08F47R0V			2
79,	R43, R46	220R	SMD thick film resistor 220R 0805 1% 125 mW Panasonic	ERJ6ENF220V	resistors.SVNDblb	Panasonic	ERJ6ENF220V	Digi-Key	P220CCT-ND	Mouser	667-ERJ-6ENF2200V	2
80,	R45, R54, R77, R89, R90	10k	SMD thick film resistor 10k 0805 1% 125 mW Panasonic	ERJ6ENF1002V	resistors.SVNDblb	Panasonic	ERJ6ENF1002V	Digi-Key	P10.0KCCCT-ND	Mouser	667-ERJ-6ENF1002V	5
81,	R47, R52, R56, R57, R106, R107	3k3	SMD thick film resistor 3k3 1206 1% 660 mW Panasonic	ERJ6PFB3301V	resistors.SVNDblb	Panasonic	ERJ6PFB3301V	Mouser	667-ERJ-P08F3301V	Farnell	1750843	6
82,	R48	100R	SMD thick film resistor 100R 1206 1% 660 mW Panasonic	ERJ6PFB100V	resistors.SVNDblb	Panasonic	ERJ6PFB100V	Farnell	1750824	Mouser	667-ERJ-P08F1000V	1
83,	R49, R62	22k	SMD thick film resistor 22k 0805 1% 125 mW Panasonic	ERJ6ENF22K0V	resistors.SVNDblb	Panasonic	ERJ6ENF22K0V	Digi-Key	P22.0CCT-ND	Mouser	667-ERJ-6ENF22K0V	2
84,	R50	10R	SMD thick film resistor 10R 0805 1% 125 mW Panasonic	ERJ6ENF10R0V	resistors.SVNDblb	Panasonic	ERJ6ENF10R0V	Digi-Key	P10.0CCT-ND	Mouser	667-ERJ-6ENF10R0V	1
85,	R51	56k	SMD thick film resistor 56k 0805 1% 125 mW Panasonic	ERJ6ENF560V	resistors.SVNDblb	Panasonic	ERJ6ENF560V	Digi-Key	P56.0CCT-ND	Mouser	667-ERJ-6ENF5602V	1
86,	R59	8R2	SMD thick film resistor 8R2 0805 5% 125mW 150V Vishay	CRCW08058R20NEAIF	resistors.SVNDblb	Vishay Draloric	CRCW08058R20NEAIF	Farnell	1739201	Digi-Key	CRCW08058R20NEAIF-ND	1
87,	R60, R82	330R	SMD thick film resistor 330R 0805 1% 125 mW Panasonic	ERJ6ENF330V	resistors.SVNDblb	Panasonic	ERJ6ENF330V	Digi-Key	P330CCT-ND	Mouser	667-ERJ-6ENF3300V	2
88,	R61	12k7	SMD thick film resistor 12k7 0805 1% 125 mW Panasonic	ERJ6ENF127V	resistors.SVNDblb	Panasonic	ERJ6ENF127V	Digi-Key	P12.7KCCCT-ND	Mouser	667-ERJ-6ENF1272V	1
89,	R63	78k7	SMD thick film resistor 78k7 0805 1% 125 mW Panasonic	ERJ6ENF787V	resistors.SVNDblb	Panasonic	ERJ6ENF787V	Digi-Key	P78.7KCCCT-ND	Mouser	667-ERJ-6ENF7872V	1
90,	R64	1k	SMD thick film resistor 1k 0805 1% 125 mW Panasonic	ERJ6ENF1001V	resistors.SVNDblb	Panasonic	ERJ6ENF1001V	Digi-Key	P1.00KCCCT-ND	Mouser	667-ERJ-6ENF1001V	1
91,	R65, R85	15k	SMD thick film resistor 15k 0805 1% 125 mW Panasonic	ERJ6ENF150V	resistors.SVNDblb	Panasonic	ERJ6ENF150V	Digi-Key	P15.0KCCCT-ND	Mouser	667-ERJ-6ENF1502V	2
92,	R66, R108	68k	SMD thick film resistor 68k 0805 1% 125 mW Panasonic	ERJ6ENF680V	resistors.SVNDblb	Panasonic	ERJ6ENF680V	Digi-Key	P68.0KCCCT-ND	Mouser	667-ERJ-6ENF6802V	2
93,	R67	47k	SMD thick film resistor 47k 0805 1% 125 mW Panasonic	ERJ6ENF470V	resistors.SVNDblb	Panasonic	ERJ6ENF470V	Digi-Key	P47.0KCCCT-ND	Mouser	667-ERJ-6ENF4702V	1
94,	R68	1R3	SMD current sense resistor 1R3 1206 1% 330mW Panasonic	ERJ6BQF1R3V	resistors.SVNDblb	Panasonic	ERJ6BQF1R3V	Farnell	1892987	Mouser	667-ERJ-8BQF1R3V	1
95,	R69	2k49	SMD thick film resistor 2k49 0805 1% 125 mW Panasonic	ERJ6ENF249V	resistors.SVNDblb	Panasonic	ERJ6ENF249V	Digi-Key	P2.49KCCCT-ND	Mouser	667-ERJ-6ENF2491V	1
96,	R70	56R	SMD thick film resistor 56R 0805 1% 125 mW Panasonic	ERJ6ENF56R0V	resistors.SVNDblb	Panasonic	ERJ6ENF56R0V	Digi-Key	P56.0CCT-ND	Mouser	667-ERJ-6ENF56R0V	1
97,	R75	16k2	SMD thick film resistor 16k2 0805 1% 125 mW Panasonic	ERJ6ENF162V	resistors.SVNDblb	Panasonic	ERJ6ENF162V	Digi-Key	P16.2KCCCT-ND	Mouser	667-ERJ-6ENF1622V	1
98,	R76	300u	SMD Current Sense Resistor with Kelvin connection, 300uOhm, 7W, ± 1%, Power Metal Strip, Vishay	WSL4026L3000FEB	resistors.SVNDblb	Vishay	WSL4026L3000FEB	Digi-Key	WSLR-0003CT-ND	Mouser	71-WSL4026L3000FEB	12
99,	R84, R88	680R	SMD thick film resistor 680R 0805 1% 125 mW Panasonic	ERJ6ENF680V	resistors.SVNDblb	Panasonic	ERJ6ENF680V	Digi-Key	P680CCT-ND	Mouser	667-ERJ-6ENF6800V	2
100,	R86	1R6	SMD thick film resistor 1R6 0805 1% 125 mW Panasonic	ERJ6ENF1R6V	resistors.SVNDblb	Panasonic	ERJ6ENF1R6V	Digi-Key	P1R6KCCCT-ND	Mouser	667-ERJ-6ENF1R62V	1
101,	R87	12R	SMD thick film resistor 12R 0805 1% 125 mW Panasonic	ERJ6ENF12R0V	resistors.SVNDblb	Panasonic	ERJ6ENF12R0V	Digi-Key	P12.0CCT-ND	Mouser	667-ERJ-6ENF12R0V	1
102,	R103, R104	60R4	SMD thick film resistor 60R4 0805 1% 125 mW Panasonic	ERJ6ENF60R4V	resistors.SVNDblb	Panasonic	ERJ6ENF60R4V	Digi-Key	P60.4CCT-ND	Mouser	667-ERJ-6ENF60R4V	2
103,	R105	1k2	SMD thick film resistor 1k2 0805 1% 125 mW Panasonic	ERJ6ENF1201V	resistors.SVNDblb	Panasonic	ERJ6ENF1201V	Digi-Key	P1.20KCCCT-ND	Mouser	667-ERJ-6ENF1201V	1
104,	R109	68k	SMD thick film resistor 68k 0805 1% 125 mW Panasonic	ERJ6ENF6802V	resistors.SVNDblb	Panasonic	ERJ6ENF6802V	Digi-Key	P68.0KCCCT-ND	Mouser	667-ERJ-6ENF6802V	1
105,	R110	120k	SMD thick film resistor 120k 0805 1% 125 mW Panasonic	ERJ6ENF1203V	resistors.SVNDblb	Panasonic	ERJ6ENF1203V	Digi-Key	P120KCCCT-ND	Mouser	667-ERJ-6ENF1203V	1
106,	R111, R113	7k5	SMD thick film resistor 7k5 0805 1% 125 mW Panasonic	ERJ6ENF750V	resistors.SVNDblb	Panasonic	ERJ6ENF750V	Digi-Key	P7.50KCCCT-ND	Mouser	667-ERJ-6ENF7501V	2
107,	R112	91k	SMD thick film resistor 91k 0603 1% 100 mW Panasonic	ERJ6KF9102V	resistors.SVNDblb	Panasonic	ERJ6KF9102V	Digi-Key	P91.0KHCT-ND	Mouser	667-ERJ-3EFK9102V	1
108,	R114	20k	SMD thick film resistor 20k 0603 1% 100 mW Panasonic	ERJ6KF2002V	resistors.SVNDblb	Panasonic	ERJ6KF2002V	Digi-Key	P20.0KHCT-ND	Mouser	667-ERJ-3EFK2002V	1
109,	SD4H, SD4L, SD8H, SD8L, SD51, SD52, SD53, SD54, SQ4H, SQ4L, SQ8H, SQ8L	M3x16 DIN7985	Pan head cross screw M3x16 DIN7985	M3x16_DIN7985	specials.SVNDblb							12
110,	SDCNEG, SDCPOS, SSEC1, SSEC2, SSWA, SSWB	Screw M5x10 inhex low head DIN7984		M5x10_DIN7984	specials.SVNDblb							6
111,	SPB1, SPB2, SPB3, SPB4, SPB5, SPB6, SPB7	Spacer M4 M/F 30mm	Brass spacer external/Internal M4 thread 30mm Würth Elektronik	971300471	specials.SVNDblb			Digi-Key	732-10467-ND	Würth Elektronik	971300471	7
112,	SPCPB1, SPCPB2, SPCPB3, SPCPB4, SPCPT1, SPCPT2, SPCPT3, SPCPT4	plastic spacer M/F M3x10	Plastic spacer internal/external M3 height 10mm Würth Elektronik	971100365	specials.SVNDblb			Digi-Key	732-13056-ND	Würth Elektronik	971100365	8
113,	SPT1, SPT2, SPT3, SPT4, SPT5, SPT6, SPT7	Spacer M4 F/F 60mm	Brass spacer internal/Internal M4 thread 60mm Würth Elektronik	970600471	specials.SVNDblb			Digi-Key	732-10671-ND	Würth Elektronik	970600471	7
114,	SQ1, SQ2, SQ4, SQ5, SU8	M3x8 DIN7985	Pan head cross screw M3x8 DIN7985	M3x8_DIN7985	specials.SVNDblb							5
115,	TP1, TP10, TP13, TP19, TP27	GREEN	PTH testpoint eyelet 3.2mm green Keystone Electronics	5121	connectors.SVNDblb	Keystone Electronics	5121	Digi-Key	36-5121-ND	Mouser	534-5121	1
116,	TP2, TP7, TP20, TP23, TP24, TP41, TP44	ORANGE	PTH testpoint eyelet 3.2mm orange Keystone Electronics	5008	connectors.SVNDblb	Keystone Electronics	5008	Digi-Key	36-5008-ND	Mouser	534-5008	7
117,	TP3, TP4, TP8, TP32, TP35, TP36, TP37, TP43	RED	PTH testpoint eyelet 3.2mm red Keystone Electronics	5005	connectors.SVNDblb	Keystone Electronics	5005	Digi-Key	36-5005-ND	Mouser	534-5005	8
118,	TP5, TP11, TP21, TP26, TP31, TP46, TP48	BROWN	PTH testpoint eyelet 3.2mm brown Keystone Electronics	5120	connectors.SVNDblb	Keystone Electronics	5120	Digi-Key	36-5120-ND	Mouser	534-5120	7
119,	TP6, TP12, TP17, TP18, TP25, TP39	BLUE	PTH testpoint eyelet 3.2mm blue Keystone Electronics	5122	connectors.SVNDblb	Keystone Electronics	5122	Digi-Key	36-5122-ND	Mouser	534-5122	6
120,	TP9, TP16, TP34, TP38, TP42, TP45	BLACK	PTH testpoint eyelet 3.2mm black Keystone Electronics	5006	connectors.SVNDblb	Keystone Electronics	5006	Digi-Key	36-5006-ND	Mouser	534-5006	6
121,	TP14, TP15, TP33	WHITE	PTH testpoint eyelet 3.2mm white Keystone Electronics	5007	connectors.SVNDblb	Keystone Electronics	5007	Digi-Key	36-5007-ND	Mouser	534-5007	3
122,	TP12, TP28, TP40	YELLOW	PTH testpoint eyelet 3.2mm yellow Keystone Electronics	5009	connectors.SVNDblb	Keystone Electronics	5009	Digi-Key	36-5009-ND	Mouser	534-5009	1
123,	TP29	GRAY	PTH testpoint eyelet 3.2mm gray Keystone Electronics	5123	connectors.SVNDblb	Keystone Electronics	5123	Digi-Key	36-5123-ND	Mouser	534-5123	1
124,	TP30, TP47	PURPLE	PTH testpoint eyelet 3.2mm purple Keystone Electronics	5124	connectors.SVNDblb	Keystone Electronics	5124	Digi-Key	36-5124-ND	Mouser	534-5124	2
125,	TR1	760 301 302	Transformer for gate drive one output	760301302	transformers.SVNDblb	Würth Elektronik	760301302	Digi-Key	732-5630-2-ND	Mouser	710-760301302	1
126,	TR2	750 315 046	Transformer for DC-DC converter 750 315 046 Würth Elektronik	750315046	transformers.SVNDblb	Würth Elektronik	750315046	Würth Elektronik	750315046			3
127,	U1, U3, U9	MC74ACCT74	Dual D-Type Positive Edge-Triggered Flip-Flop with asynchronous set/reset ON Semiconductor	MC74ACCT74DR2G	ics.SVNDblb	ON Semiconductor	MC74ACCT74DR2G	Digi-Key	MC74ACT74DR2GOSCT-ND	Mouser	863-MC74ACT74DR2G	1
128,	U2	MC74HC30A	8-input NAND gate, high speed ON Semiconductor	MC74HC30ADG	ics.SVNDblb	ON Semiconductor	MC74HC30ADG	Digi-Key	MC74HC30ADG-ND	Mouser	863-MC74HC30ADG	1
129,	U4	NCP43040A	Secondary side synchronous rectification driver	NCP43040ADRG	ics.SVNDblb	ON Semiconductor	NCP43040ADRG	Digi-Key	NCP43040ADRGOSCT-ND	Mouser	863-NCP43040ADRG	1
130,	U5	NCP1252D	Physack/Forward controller ON Semiconductor	NCP1252DORRG	ics.SVNDblb	ON Semiconductor	NCP1252DORRG	Digi-Key	NCP1252DORRGOSTR-ND	Mouser	863-NCP1252DORRG	1
131,	U6	NCV210RSQ12G	Current Sense Amplifier, 26V, Low-/High-Side Voltage Out, Bidirectional Current Shunt Monitor, fixed gain 200	NCV210RSQ12G	ics.SVNDblb	ON Semiconductor	NCV210RSQ12G	Digi-Key	NCV210RSQ12G-ND	Mouser	863-NCV210RSQ12G	1

#	Designator	Comment	Description	LibRef	SourceLibraryName	Manufacturer	Manufacturer Part Number	Supplier	Supplier Part Number	Supplier 2	Supplier Part Number 2	Quantity
132	U7	LM321	Single channel operational amplifier, 3-32 V, bipolar, ON Semiconductor	LM321SN3T1G	ics.SVNDblib	ON Semiconductor	LM321SN3T1G	Digi-Key	LM321SN3T1GOSCT-ND	Mouser	863-LM321SN3T1G	1
133	U8	TC74AS-3.3VAT	Digital temperature sensor with serial interface -40 - 125°C, I2C address 0xA5, optimized for 3.3V, Microchip	TC74AS-3.3VAT	ics.SVNDblib	Microchip	TC74AS-3.3VAT	Digi-Key	TC74AS-3.3VAT-ND	Mouser	579-TC74AS-3.3VAT	1
134	U10, U11	MC74VHC1G32	2-Input OR Gate/CMOS Logic Level Shifter ON Semiconductor	MC74VHC1G32DTT1G	ics.SVNDblib	ON Semiconductor	MC74VHC1G32DTT1G	Digi-Key	MC74VHC1G32DTT1GOSCT-ND	Mouser	863-MC74VHC1G32DTT1G	2
135	U12	NCV7342D13R2G	High speed low power CAN transceiver with dual supply ON Semiconductor	NCV7342D13R2G	ics.SVNDblib	ON Semiconductor	NCV7342D13R2G	Digi-Key	NCV7342D13R2GOSCT-ND	Mouser	863-NCV7342D13R2G	1
136	WBUS	Insulation bush IB6 fo M3 and TO220	Isolating bush IB6 for M3 and TO220 Fischer Elektronik	IB6	specials.SVNDblib			Fischer Elektronik	IB6			1
137	WIDAH, WIDAL, WIDBH, WIDBL, WIDS1, WIDS2, WIDS3, WIDS4, WIDAH, WIQAL, WIOBH, WIDBL	AOS 3 P 2 23x20x1 D3.6	Ceramic insulation washer with hole for TO247 1mm Fischer Elektronik	AOS3P2	specials.SVNDblib			Fischer Elektronik	AOS 3 P 2			12
138	WIU8	AOS 220 18x12x1.5 D3.1	Ceramic insulation washer with hole for TO220 1.5mm Fischer Elektronik	AOS220	specials.SVNDblib			Fischer Elektronik	AOS 220			1
139	WPQ4H, WPQAL, WPQBH, WPQBL, WPQ51, WPQ52, WPQ53, WPQ54, WPQ1A, WPQ1B, WPQ2, WPQ4A, WPQ4B, WPQ5, WPQAH, WPQAL, WPQBH, WPQBL, WPUL8	plain washer M3 DIN125A	Plain washer for M3 screw according DIN125A	M3_DIN125A	specials.SVNDblib							19
140	WPDCNEG, WPDCPOS, WPSEC1, WPSEC2, WPSWA, WPSWB	plain washer M5 DIN125A	Plain washer M5 DIN125A	M5_DIN125A	specials.SVNDblib							6
141	WSDAH, WSDAL, WSDBH, WSOBL, WSDS1, WSDS2, WSDS3, WSDS4, WSQ1, WSQ2, WSQ4, WSQ5, WSOAH, WSOAL, WSQBH, WSQBL, WSUL8	spring washer M3 DIN7980	Spring lock washer for M3 screw according DIN7980	M3_DIN7980	specials.SVNDblib							17
142	WSDCNEG, WSDCPOS, WSSEC1, WSSEC2, WSSWA, WSSWB	Spring washer M5 DIN7980	Spring lock washer M5 DIN7980	M5_DIN7980	specials.SVNDblib							6

Project: Source Data From: Project: Variant:	OBC_LLC_resonant_tank_WE_board.PrjPcb OBC_LLC_resonant_tank_WE_board.PrjPcb OBC_LLC_resonant_tank_WE_board.PrjPcb standard_board	Bill of Materials 
--	--	---

#	Designator	Comment	Description	LibRef	SourceLibraryName	Manufacturer	Manufacturer Part Number	Supplier	Supplier Part Number	Supplier 2	Supplier Part Number 2	Quantity
143	BRL	custom left bracket	Custom made left bracket for San Ace 60 fan series	custom_bracket_San_Ace60_left	specials.SVNDblib			custom part	undefined - lab work			1
144	BR	custom right bracket	Custom made right bracket for San Ace 60 fan series	custom_bracket_San_Ace60_right	specials.SVNDblib			custom part	undefined - lab work			1
145	C1	100 uF	Polymer ALU elco 100uF 35V 30mOhm 20% Würth Elektronik	875115652007	connectors.SVNDblib	Würth Elektronik	875115652007	Würth Elektronik	875115652007			1
146	CP_FAN1, CP_FAN2, CP_FAN3, CP_FAN4	46235-0001	Crimp female terminal for wires AWG 30-26 Molex	46235-0001	connectors.SVNDblib	Molex	46235-0001	Digi-Key	WM7082CT-ND	Mouser	538-46235-0001	4
147	CR1H, CR1L, CR2H, CR2L, CR3L, CR4H, CR4L, CR5H, CR5L, CR6L, CR7H, CR7L, CR8H, CR8L, CR9H, CR9L, CR10H, CR10L, CR11H, CR11L	10 nF	MLCC capacitor 10nF 1000V C0G ±5% TDK	CGA6P1C0G3A103I250AC	capacitors.SVNDblib	TDK	CGA6P1C0G3A103I250AC	Digi-Key	445-174793-1-ND	Mouser	810-A6P13A13I25AC	22
148	D1	MMSZ5243B	Zener diode 13 V 500 mW SOD123 ON Semiconductor	MMSZ5243BT1G	diodes.SVNDblib	ON Semiconductor	MMSZ5243BT1G	Digi-Key	MMSZ5243BT1GOSCT-ND	Mouser	863-MMSZ5243BT1G	1
149	FAN1	Fan 24V 60x60x38mm without ribs	Fan 24VDC 60x60x38mm San Ace 60 Sanyo Denki	90V0624P1G031	specials.SVNDblib			Digi-Key	1688-1657-ND	Mouser	978-90V0624P1G031	1
150	GR_FAN	Fan finger guard for 60x60mm fans	Fan finger guard for 60x60mm fans Multicomp	MC32086	specials.SVNDblib			Farnell	2292912			1
151	J_COOL	691 322 110 004	PCB right angle connector 4 pins 3.5 mm pitch Würth Elektronik	691322110004	connectors.SVNDblib	Würth Elektronik	691322110004	Farnell	1841317	Mouser	710-691322110004	1
152	J_COOLa	691 361 100 004	Vertical cable inputs connector for WR-TBL 3.5mm series 4 screw terminals Würth Elektronik	691361100004	connectors.SVNDblib	Würth Elektronik	691361100004	Digi-Key	732-2753-ND	Mouser	710-691361100004	1
153	J_FAN	43045-0427	PCB vertical connector 4 pins 3.00 mm pitch Molex	43045-0400	connectors.SVNDblib	Molex	43045-0427	Digi-Key	WM10667-ND	Mouser	538-43045-0427	1
154	J_FANa	43025-0400	Molex Microfit receptacle 4 positions	43025-0400	connectors.SVNDblib	Molex	43025-0400	Digi-Key	WM1784-ND	Mouser	538-43025-0400	1
155	J_S1, J_S2, J_SWA, J_SWB	746 550 95	Redcube terminal 10x10mm screw 5mm Würth Elektronik	74655095	connectors.SVNDblib	Würth Elektronik	74655095	Würth Elektronik	74655095	Digi-Key	732-10903-1-ND	4
156	LR	34.5 uH	Inductor for OBC LLC converter 34.5uH 20 A 65 A 11 mOhm Würth Elektronik	750317850	inductors.SVNDblib	Würth Elektronik	750317850	Würth Elektronik	750317850			1
157	P_BACK	custom plastic back panel for OBC LLC board with WE parts	Custom plastic back panel for OBC LLC board with WE parts	MECH_OBC_LLC_WE_board_back_panel	specials.SVNDblib							1
158	P_FRONT	custom plastic front panel for OBC LLC board with WE parts	Custom plastic front panel for OBC LLC board with WE parts	MECH_OBC_LLC_WE_board_front_panel	specials.SVNDblib							1
159	Q1	MUN5213DW1	Dual channel NPN BRT 50 V 100 mA ON Semiconductor	MUN5213DW1T1G	transistors.SVNDblib	ON Semiconductor	MUN5213DW1T1G	Digi-Key	MUN5213DW1T1GOSCT-ND	Mouser	863-MUN5213DW1T1G	1
160	Q2	NTF2955	PMOS 60V 2.6A 145mOhm ON Semiconductor	NTF2955T1G	transistors.SVNDblib	ON Semiconductor	NTF2955T1G	Digi-Key	NTF2955T1GOSCT-ND	Mouser	863-NTF2955T1G	1
161	R1	22k	SMD thick film resistor 22k 0603 1% 100 mW Panasonic	ERJ3K4F1202V	resistors.SVNDblib	Panasonic	ERJ3K4F1202V	Digi-Key	P22.0KHC-ND	Mouser	667-ERJ-3K4F1202V	1
162	R2, R3	10k	SMD thick film resistor 10k 0603 1% 100 mW Panasonic	ERJ3K4F1002V	resistors.SVNDblib	Panasonic	ERJ3K4F1002V	Digi-Key	P10.0KHC-ND	Mouser	667-ERJ-3K4F1002V	2
163	SBRL, SBRR, SPNR1, SPNR2, SPNR3, SPNB4, SPNF1, SPNF2, SPNF3, SPNF4	M3x8 DIN7985	Pan head cross screw M3x8 DIN7985	M3x8_DIN7985	specials.SVNDblib							10
164	SFANL, SFANR	M4x10 DIN7985	Pan head cross screw M4x10 DIN7985	MA4x10_DIN7985	specials.SVNDblib							2
165	SPB1, SPB2	Spacer M4 M/f 30mm	Brass spacer external/internal M4 thread 30mm Würth Elektronik	971300471	specials.SVNDblib			Digi-Key	732-10467-ND	Würth Elektronik	971300471	2
166	SPT1, SPT2	Spacer M4 M/f 60mm	Steel spacer external/internal M4 thread 60mm Würth Elektronik	971600471	specials.SVNDblib			Digi-Key	732-10505-ND	Würth Elektronik	971600471	2
167	SS1, SS2, SSWA, SSWB	Screw M5x10 inhex low head DIN7984		M5x10_DIN7984	specials.SVNDblib							4
168	TP1A, TP6	RED	PTH testpoint eyelet 3.2mm red Keystone Electronics	5005	connectors.SVNDblib	Keystone Electronics	5005	Digi-Key	36-5005-ND	Mouser	534-5005	2
169	TP1B	YELLOW	PTH testpoint eyelet 3.2mm yellow Keystone Electronics	5009	connectors.SVNDblib	Keystone Electronics	5009	Digi-Key	36-5009-ND	Mouser	534-5009	1
170	TP2A, TP2B	BLUE	PTH testpoint eyelet 3.2mm blue Keystone Electronics	5122	connectors.SVNDblib	Keystone Electronics	5122	Digi-Key	36-5122-ND	Mouser	534-5122	2
171	TP3	GRAY	PTH testpoint eyelet 3.2mm gray Keystone Electronics	5123	connectors.SVNDblib	Keystone Electronics	5123	Digi-Key	36-5123-ND	Mouser	534-5123	1
172	TP4, TP8, TP10	BROWN	PTH testpoint eyelet 3.2mm brown Keystone Electronics	5120	connectors.SVNDblib	Keystone Electronics	5120	Digi-Key	36-5120-ND	Mouser	534-5120	3
173	TP5	ORANGE	PTH testpoint eyelet 3.2mm orange Keystone Electronics	5008	connectors.SVNDblib	Keystone Electronics	5008	Digi-Key	36-5008-ND	Mouser	534-5008	1
174	TP7	BLACK	PTH testpoint eyelet 3.2mm black Keystone Electronics	5006	connectors.SVNDblib	Keystone Electronics	5006	Digi-Key	36-5006-ND	Mouser	534-5006	1
175	TP9, TP11	WHITE	PTH testpoint eyelet 3.2mm white Keystone Electronics	5007	connectors.SVNDblib	Keystone Electronics	5007	Digi-Key	36-5007-ND	Mouser	534-5007	2
179	TR1, TR2	750 317 849	Transformer for OBC LLC converter 67uH 1:1 1kW	750317849	transformers.SVNDblib	Würth Elektronik	750317849	Würth Elektronik	750317849			2
180	WPS1, WPS2, WPSWA, WPSWB	plain washer M5 DIN125A	Plain washer M5 DIN125A	M5_DIN125A	specials.SVNDblib							4
181	WSS1, WSS2, WSSWA, WSSWB	Spring washer M5 DIN7980	Spring lock washer M5 DIN7980	M5_DIN7980	specials.SVNDblib							4