

Table 1: STDES-VIENNARECT bill of materials - control board

Item	Q.ty	Ref.	Part / Value	Description	Manufacturer	Order code
1	1	C1	4.7 μ F, 10V, \pm 10%	Multilayer Ceramic Capacitor MLCC , 805	ANY	ANY
2	10	C2, C5, C11, C18, C24, C32, C43, C51, C58, C59	100nF, 16V, \pm 10%	Multilayer Ceramic Capacitor MLCC , 603	ANY	ANY
3	2	C3, C4	10nF, 50V, \pm 10%	Multilayer Ceramic Capacitor MLCC , 603	ANY	ANY
4	5	C7, C23, C33, C45, C53	1 μ F, 25V, \pm 10%	Multilayer Ceramic Capacitor MLCC , 603	ANY	ANY
5	6	C8, C9, C54, C55, C56, C57	100pF, 50V, \pm 5%	Multilayer Ceramic Capacitor MLCC , 603	ANY	ANY
6	1	C12	220pF, 50V, \pm 5%	Multilayer Ceramic Capacitor MLCC , 603	ANY	ANY
7	2	C13, C60	220nF, 50V, \pm 10%	Multilayer Ceramic Capacitor MLCC , 603	ANY	ANY
8	4	C27, C29, C42, C50 (not mounted)	100pF, 50V, \pm 5%	Multilayer Ceramic Capacitor MLCC , 603	ANY	ANY
9	3	C28, C38, C46	1.5nF, 50V, \pm 10%	Multilayer Ceramic Capacitor MLCC , 603	ANY	ANY
10	1	C30	10pF, 50V, \pm 5%	Multilayer Ceramic Capacitor MLCC , 603	ANY	ANY
11	3	C31, C41, C49 (not mounted)	15nF, 25V, \pm 5%	Multilayer Ceramic Capacitor MLCC , 603	ANY	ANY
12	3	C34, C44, C52	1nF, 25V, \pm 5%	Multilayer Ceramic Capacitor MLCC , 603	ANY	ANY
13	3	C35, C39, C47	2.2nF, 50V, \pm 10%	Multilayer Ceramic Capacitor MLCC , 603	ANY	ANY
14	3	C36, C40, C48	330pF, 50V, \pm 5%	Multilayer Ceramic Capacitor MLCC , 603	ANY	ANY
15	1	D1	RED, 2.4V	LED, SMD 0805	ANY	ANY
16	1	D2	GREEN, 2.8V	LED, SMD 0805	ANY	ANY
17	1	J2	SWIM I/F	4 Way, 1 Row, Straight Pin Header, strip4_100m_v	ANY	ANY
18	1	J3	CON4	4 Way, 1 Row, Straight Pin Header, strip4_100m_v	ANY	ANY

Item	Q.ty	Ref.	Part / Value	Description	Manufacturer	Order code
19	1	J10	CON40A	Molex C-Grid III 90122, 40 Way, 2 Row, Right Angle Pin Header, strip_sckt_40_2x20_	ANY	ANY
20	1	L1	WE-CBF, 500mA	Ferrite Bead, 120 Ω , WE-CBF Series, 0.3 Ω , \pm 25%, 603	WE	74279262
21	2	R1, R2 (not mounted)	1k, \pm 1%	SMD Resistor, 603	ANY	ANY
22	4	R4, R7, R60, R61	10k, \pm 1%	SMD Resistor, 1206	ANY	ANY
23	8	R8, R9, R32, R44, R54, R58, R59, R62	10k, \pm 1%	SMD Resistor, 603	ANY	ANY
24	3	R14, R15, R21 (not mounted)	10k, \pm 0.1%	SMD Resistor, 603	ANY	ANY
25	1	R20 (not mounted)	22k, \pm 1%	SMD Resistor, 603	ANY	ANY
26	1	R22	2.2k, \pm 1%	SMD Resistor, 603	ANY	ANY
27	1	R23 (not mounted)	18k, \pm 0.1%	SMD Resistor, 603	ANY	ANY
28	3	R24, R45, R55 (not mounted)	2.4k, \pm 1%	SMD Resistor, 603	ANY	ANY
29	1	R25 (not mounted)	220K, \pm 1%	SMD Resistor, 603	ANY	ANY
30	6	R26, R27, R40, R41, R50, R51	56k, \pm 1%	SMD Resistor, 603	ANY	ANY
31	3	R28, R47, R57 (not mounted)	7.5k, \pm 1%	SMD Resistor, 603	ANY	ANY
32	6	R29, R31, R39, R46, R49, R56	0, \pm 1%	SMD Resistor, 603	ANY	ANY
33	3	R30, R43, R53 (not mounted)	27k, \pm 1%	SMD Resistor, 603	ANY	ANY
34	3	R33, R38, R48 (not mounted)	n.c.	N.A., 603	n.c.	n.c.
35	3	R34, R42, R52 (not mounted)	47k, \pm 1%	SMD Resistor, 603	ANY	ANY
36	24	TP1, TP2, TP3, TP4, TP5, TP6, TP7, TP8, TP9, TP10, TP11, TP12, TP13, TP14, TP15, TP16, TP17, TP18, TP19, TP20, TP21, TP22, TP23, TP24	TestPoint	1mm Black Test Terminal, TestPoint	ANY	ANY
37	1	U4	TSV911ILT	High Speed, Op Amp, RRIO, 8MHz, , SOT23-5L	ST	TSV911ILT
38	3	U5, U7, U9	LMV358IDT	Low Power, Op Amp, RRIO, 1.3MHz, SO8	ST	LMV358IDT

Item	Q.ty	Ref.	Part / Value	Description	Manufacturer	Order code
39	1	U12	STNRG388A	Digital controller, tssop38	ST	STNRG388A

Table 2: STDES-VIENNARECT bill of materials - power board

Item	Q.ty	Ref.	Part / Value	Description	Manufacturer	Order code
1	28	C1, C9, C10, C11, C19, C20, C21, C29, C30, C33, C34, C44, C47, C48, C58, C65, C66, C76, C84, C86, C94, C102, C148, C149, C164, C178, C194, C206 (not mounted)	-	SMD 0603(1608)	ANY	ANY
2	1	C240 (not mounted)	-	SMD 0805(2012)	ANY	ANY
3	57	C2, C4, C6, C8, C12, C14, C16, C17, C22, C24, C27, C28, C31, C35, C37, C39, C40, C41, C42, C45, C49, C51, C53, C54, C55, C56, C60, C61, C63, C67, C69, C71, C72, C73, C74, C77, C78, C79, C81, C83, C85, C88, C90, C91, C93, C96, C98, C99, C101, C104, C105, C125, C127, C152, C160, C180, C186	100nF/16V, 16V, ±10%	Multilayer Ceramic Capacitor MLCC, SMD 0603(1608)	ANY	ANY
4	34	C3, C5, C7, C13, C15, C18, C23, C25, C26, C32, C36, C43, C46, C50, C57, C59, C62, C64, C68, C75, C80, C82, C87, C92, C95, C100, C103, C106, C123, C124, C151, C159, C179, C185	1µF, 25V, ±10%	Multilayer Ceramic Capacitor MLCC, SMD 0603(1608)	ANY	ANY
5	5	C38, C52, C70, C89, C97	4.7µF, 25V, ±10%	Multilayer Ceramic Capacitor MLCC, SMD 0603(1608)	ANY	ANY
6	10	C107, C108, C114, C116, C117, C118, C119, C120, C121, C122 (not mounted)	TBD, 440VAC, ±20%	Radial, Disc	TBD	TBD

Item	Q.ty	Ref.	Part / Value	Description	Manufacturer	Order code
7	6	C109, C110, C111, C112, C113, C115 (not mounted)	TBD, 305Vac, ±20%	Radial	TBD	TBD
8	30	C126, C128, C130, C132, C137, C138, C141, C142, C145, C150, C153, C154, C157, C161, C166, C167, C170, C173, C174, C176, C181, C182, C188, C189, C195, C196, C198, C200, C201, C204	2.2µF, 50V, ±10%	Multilayer Ceramic Capacitor MLCC, SMD 1206(3216)	ANY	ANY
9	12	C129, C134, C140, C144, C156, C163, C169, C175, C184, C191, C197, C203	100nF, 25V, ±5%	Multilayer Ceramic Capacitor MLCC, SMD 1206(3216)	ANY	ANY
10	12	C131, C133, C139, C143, C155, C162, C168, C172, C183, C190, C193, C202	1nF, 50V, ±10%	Multilayer Ceramic Capacitor MLCC, SMD 1206(3216)	ANY	ANY
11	6	C135, C136, C158, C165, C187, C192	220pF, 50V, ±5%	Multilayer Ceramic Capacitor MLCC, SMD 0603(1608)	ANY	ANY
12	12	C146, C147, C171, C177, C199, C205, C219, C220, C223, C225, C226, C228	470nF, 50V, ±10%	Multilayer Ceramic Capacitor MLCC, smd 0805(2012)	ANY	ANY
13	6	C207, C210, C211, C213, C216, C217	100nF, 630VDC, ±10%	CAP FILM RADIAL, Radial	EPCOS (TDK)	B32652A6104K289
14	4	C208, C209, C214, C215	470µF, 500V, ±20%	CAP ALUM SNAP, Radial, Can - Snap-In	Vishay BC Components	MAL215759471E3
15	1	C212	100nF, 1KVDC, ±10%	CAP FILM RADIAL, Radial	KEMET	R474N310050A1K
16	7	C218, C221, C222, C224, C227, C229, C236	10µF, 25V, ±20%	Multilayer Ceramic Capacitor MLCC, smd 0805(2012)	ANY	ANY
17	1	C230	3,3nF, 200V, ±10%	Multilayer Ceramic Capacitor MLCC, SMD 1206(3216)	ANY	ANY
18	1	C231	560µF, 16V, ±20%	CAP ALUM POLY T/H, Radial, Can	Panasonic Electronic Components	16SEPF560M
19	2	C232, C237 (not mounted)	TBD	TBD, 0805 (2012 Metric)	NM	NM

Item	Q.ty	Ref.	Part / Value	Description	Manufacturer	Order code
20	2	C233, C234 (not mounted)	TBD, ±20%	TBD, 0805 (2012 Metric)	NM	NM
21	1	C235	15µF, 450V, ±20%	CAP ALUM RADIAL, Radial, Can	Panasonic Electronic Components	EEU-EE2W150
22	1	C238	680µF, 10V, ±20%	CAP ALUM RADIAL, Radial, Can	Panasonic Electronic Components	EEU--FR1C681L
23	1	C239	15µF, 35V, ±20%	CAP ALUM RADIAL, Radial, Can	Panasonic Electronic Components	EEA-GA1V150
24	1	C241	100nF, 50V, ±10%	Multilayer Ceramic Capacitor MLCC, 0805 (2012 Metric)	ANY	ANY
25	1	C242	220pF, 100V, ±5%	Multilayer Ceramic Capacitor MLCC, 0805 (2012 Metric)	ANY	ANY
26	6	C243 C245 C246 C247 C248 C249	1nF, 50V, ±5%	Multilayer Ceramic Capacitor MLCC, SMD 0603(1608)	ANY	ANY
27	3	D1, D2, D3	30V, 1A	DIODE SCHOTTKY, DO-214AC, SMA	ST	STPS1L30A
28	23	D4, D5, D6, D17, D18, D19, D20, D30, D32, D33, D34, D44, D46, D53, D54, D55, D56, D57, D58, D59, D60, D66, D67	RED, 20mA	LED CLEAR, 1206 (3216 Metric)	Lumex Opto/Components Inc.	SML-LX1206SIC-TR
29	12	D7, D8, D12, D14, D21, D23, D24, D29, D35, D37, D38, D43	20V, 500MW	DIODE ZENER, DO-213AC, MINI-MELF, SOD-80	Vishay Semiconducto Diodes Division	TZMB20-GS08
30	12	D11, D13, D15, D16, D26, D27, D28, D31, D39, D41, D42, D45	3.3V, 500MW	DIODE ZENER, DO-213AC, MINI-MELF, SOD-80	Vishay Semiconducto Diodes Division	TZMB3V3-GS08
31	6	D47, D48, D49, D50, D51, D52	1.2KV, 20A	DIODE SCHOTTKY, TO-220-2	ST	STPSC20H12D
32	1	D61	100V, 2A	DIODE SCHOTTKY, DO-214AC, SMA	ST	STPS2H100A
33	1	D62	600V, 1A	DIODE GEN PURP, DO-214AC, SMA	ST	STTH1L06A
34	2	D63, D65	150V, 1A	DIODE SCHOTTKY, DO-214AC, SMA	ST	STPS1150A
35	1	D64	60V, 2A	DIODE SCHOTTKY, DO-214AC, SMA	ST	STPS2L60A
36	6	DC1, DC2, DC3, DC4, DC5, DC6	2W 12VIN +20/-5VOUT T	CONV DC/DC, 0.77" L x 0.39" W x 0.49" H (19.5mm x 9.8mm x 12.5mm)	Recom Power	R12P22005D

Item	Q.ty	Ref.	Part / Value	Description	Manufacturer	Order code
37	49	F1, F2, F3, F4, F5, F6, F7, F8, F9, F10, F11, F12, F13, F14, F15, F16, F17, F18, F19, F20, F21, F22, F23, F24, F25, F26, F27, F28, F29, F30, F31, F32, F33, F37, F38, F39, F40, F41, F42, F43, F44, F45, F46, F47, F48, F49, F50, F51, F52	30Ω at 100MHz	FERRITE BEAD, 0805 (2012 Metric)	TDK Corporation	MPZ2012S300AT000
38	3	F34, F35, F36	Fuse10X38, 250V, 30A	FUSE CLIP CARTRIDGE, 2XClips + Fuse	Eaton + Littelfuse	BK/1A3400-09-R + OFLM030,T
39	-	JP12	Con2	CONN TERM BLOCK 2POS 7.62MM PCB	Phoenix Contact	1731721 + M46:O46F46M46:N46
40	4	J1, JP55, JP56, JP57	Con2	CONN TERM BLOCK 2POS 5.08MM PCB	Phoenix Contact	1729128
41	1	J2 J2	Digital Power Connector	Connector Erni 284166 32X2	ERNI	284166 32X2
42	3	P2 X 3 P2 X 3	Adapter Digital Power Connector	Male DIN 41612 Through Hole 90 degree	ERNI	533406
43	2	J3, J10	Con3_32A	Fixed Terminal Blocks 3P 9.52mm 90DEG	Phoenix Contact	1714984
44	6	J4, J5, J6, J7, J8, J9	Con3	SIL VERTICAL PC TAIL PIN HEADER	Harwin Inc.	M20-9990345
45	2	J11, J12	Dev3, 500mA (DC)	SWITCH SLIDE SPDT	Wurth Electronics Inc.	450301014042

Item	Q.ty	Ref.	Part / Value	Description	Manufacturer	Order code
46	49	JP1, JP2, JP3, JP4, JP5, JP6, JP7, JP8, JP9, JP10, JP11, JP13, JP14, JP15, JP16, JP19, JP20, JP21, JP22, JP23, JP24, JP25, JP26, JP27, JP28, JP30, JP31, JP32, JP34, JP35, JP36, JP37, JP38, JP39, JP40, JP41, JP42, JP43, JP45, JP46, JP48, JP49, JP50, JP51, JP52, JP53, JP54, JP60, JP61 (not mounted)	Jp_pcb	Solder Jumper	-	-
47	8	JP17, JP18, JP29, JP33, JP44, JP47, JP58, JP59 (not mounted)	3JP_pcb	Solder Jumper selector	-	-
48	3	L1, L2, L3 (not mounted)	TBD, 20.5 A, $\pm 20\%$	TBD	Pulse electronics	PA0431LNL
49	3	L4, L5, L6	514 μ H	Boost Inductor	Würth Electronics Inc.	750344313
50	1	L7 (not mounted)	TBD	TBD	-	-
51	6	L9, L10, L11, L12, L13, L14	22 μ H 130mA, $\pm 20\%$	Fixed Inductor , 0805 (2012 Metric)	Taiyo Yuden	LBC2012T220M
52	2	LCM1, LCM2 (not mounted)	3Phase_Cm_Ch	TBD	TBD	TBD
53	4	LEM1, LEM2, LEM3, LEM4	5V, 15A	SENSOR CURRENT HALL AC/DC, Ring Opening 0.126" Dia, 6 Leads	LEM USA Inc.	LTSR 15-NP
54	3	3XP3	CON40A	Connector solution female 2X20,pitch, 2.54mm	Sullins Connector Solution	PPPC202LJBN-RC

Item	Q.ty	Ref.	Part / Value	Description	Manufacturer	Order code
55	15	PROBE1, PROBE2, PROBE3, PROBE4, PROBE5, PROBE6, PROBE7, PROBE8, PROBE9, PROBE10, PROBE11, PROBE12, PROBE13, PROBE14, PROBE15 (not mounted)	Current_Probe	Solder Jumper	-	-
56	1	Q1	-	MOSFET N-CH , 8-SOIC (0.154", 3.90mm Width)	ST	STS6NF20V
57	6	Q2, Q3, Q4, Q5, Q6, Q7	-	TRANS NPN , TO-243AA	ST	2STF1360
58	6	Q8, Q9, Q10, Q11, Q12, Q13	650V 45A	Silicon Carbide HIP247	ST	SCTW35N65G2V
59	8	R1, R3, R19, R21, R37, R39, R139, R141	7.5k, ±0.1%	Resistor, SMD 0603(1608)	-	ANY
60	28	R2 R8 R10 R20 R26 R28 R38 R44 R45 R56 R57 R58 R62 R71 R78 R79 R80 R84 R93 R100 R101 R102 R106 R115 R131 R140 R149 R163	0, ±1%	Resistor, SMD 0603(1608)	ANY	ANY
61	22	R4 R24 R42 R128 R191 R195 R196 R197 R198 R199 R213 R214 R215 R222 R223 R224 R237 R238 R239 R244 R247 R248 (not mounted)	N.M	Resistor, SMD 0603(1608)	ANY	ANY

Item	Q.ty	Ref.	Part / Value	Description	Manufacturer	Order code
62	38	R5, R7, R13, R16, R22, R25, R31, R34, R40, R43, R49, R52, R69, R70, R73, R74, R91, R92, R95, R96, R113, R114, R117, R118, R125, R127, R129, R133, R134, R137, R146, R147, R151, R154, R160, R161, R165, R166	#VALUE!	Resistor, SMD 0603(1608)	ANY	ANY
63	6	R6, R15, R23, R33, R41, R51	68k, $\pm 0.1\%$	Resistor, SMD 0603(1608)	ANY	ANY
64	6	R9, R17, R27, R35, R46, R53	390, $\pm 0.1\%$	Resistor, SMD 0603(1608)	ANY	ANY
65	6	R11, R18, R29, R36, R47, R54	18.7k, $\pm 0.1\%$	Resistor, SMD 0603(1608)	ANY	ANY
66	6	R12, R30, R48, R59, R81, R103	36k, $\pm 0.1\%$	Resistor, SMD 0603(1608)	ANY	ANY
67	6	R14, R32, R50, R61, R83, R105	69.8k, $\pm 0.1\%$	Resistor, SMD 0603(1608)	ANY	ANY
68	3	R55, R77, R99	30,1k, $\pm 0.1\%$	Resistor, SMD 0603(1608)	ANY	ANY
69	15	R60, R64, R65, R82, R86, R87, R104, R108, R109, R142, R143, R144, R156, R157, R158	1M, $\pm 0.1\%$	Resistor, SMD1206(3216)	ANY	ANY
70	3	R63, R85, R107	#VALUE!	Resistor, SMD 0603(1608)	ANY	ANY
71	6	R66, R68, R88, R90, R110, R112	2k, $\pm 0.1\%$	Resistor, SMD 0603(1608)	ANY	ANY
72	6	R67, R76, R89, R98, R111, R120	#VALUE!	Resistor, SMD 0603(1608)	ANY	ANY
73	5	R72, R94, R116, R150, R164	11.3k, $\pm 0.1\%$	Resistor, SMD 0603(1608)	ANY	ANY
74	5	R75, R97, R119, R152, R167	3.74k, $\pm 0.1\%$	Resistor, SMD 0603(1608)	ANY	ANY
75	1	R121	470, $\pm 1\%$	Resistor, SMD 0603(1608)	ANY	ANY
76	1	R122	5.6k, $\pm 1\%$	Resistor, SMD 0603(1608)	ANY	ANY
77	1	R123	5.1k, $\pm 1\%$	Resistor, SMD 0603(1608)	ANY	ANY
78	1	R124	22	Resistor, SMD1206(3216)	ANY	ANY

Item	Q.ty	Ref.	Part / Value	Description	Manufacturer	Order code
79	6	R193, R194, R212, R221, R236, R246	22, $\pm 1\%$	Resistor, SMD1210(3225)	ANY	ANY
80	1	R126	33k, $\pm 1\%$	Resistor, SMD 0603(1608)	ANY	ANY
81	2	R130, R136	300k, $\pm 1\%$	Resistor, SMD 0603(1608)	ANY	ANY
82	2	R132, R138	75k, $\pm 0.1\%$	Resistor, SMD 0603(1608)	ANY	ANY
83	1	R135	30k, $\pm 0.1\%$	Resistor, SMD 0603(1608)	ANY	ANY
84	4	R145, R155, R159, R169	8.2k, $\pm 0.1\%$	Resistor, SMD 0603(1608)	ANY	ANY
85	4	R148, R153, R162, R168	1.6k, $\pm 0.1\%$	Resistor, SMD 0603(1608)	ANY	ANY
86	9	R170 R171 R172 R173 R174 R175 R176 R177 R178 (not mounted)	NM	SMD0805(2012)	ANY	ANY
87	1	R179 (not mounted)		SMD1206(3216)	ANY	ANY
88	25	R180, R181, R182, R183, R202, R203, R204, R205, R206, R210, R226, R227, R228, R229, R230, R234, R250, R251, RLED1, RLED2, RLED3, RLED4, RLED5, RLED6, RLED7	1k, $\pm 1\%$	Resistor, SMD 0603(1608)	ANY	ANY
89	6	R184, R185, R209, R219, R233, R243	12	Resistor, SMD1210(3225)	ANY	ANY
90	6	R186, R188, R207, R217, R231, R241	100, $\pm 1\%$	Resistor, SMD 0603(1608)	ANY	ANY
91	12	R187 R189 R190 R192 R208 R211 R218 R220 R232 R235 R242 R245	0, $\pm 1\%$	Resistor, SMD1210(3225)	ANY	ANY
92	6	R200, R201, R216, R225, R240, R249	47k, $\pm 1\%$	Resistor, SMD1206(3216)	ANY	ANY
93	6	R252, R253, R254, R255, R256, R257	240k, $\pm 1\%$	Resistor, SMD1206(3216)	ANY	ANY
94	2	R258, R259	750, $\pm 1\%$	Resistor, SMD0805(2012)	ANY	ANY

Item	Q.ty	Ref.	Part / Value	Description	Manufacturer	Order code
95	1	260	750, $\pm 1\%$	Resistor, SMD1206(3216)	ANY	ANY
96	2	R261, R262	51k, $\pm 0.1\%$	Resistor, SMD1206(3216)	ANY	ANY
97	1	R263	10, $\pm 1\%$	Resistor, SMD 0603(1608)	TBD	-
98	2	R264, R267	27k, $\pm 0.1\%$	Resistor, SMD 0603(1608)	ANY	ANY
99	1	R265	10.2k, $\pm 0.1\%$	Resistor, SMD 0603(1608)	ANY	ANY
100	1	R266	110k, $\pm 0.1\%$	Resistor, SMD 0603(1608)	ANY	ANY
101	3	RT1, RT2, RT3	5 Ω , 20A, $\pm 20\%$	Inrush Current Limiters 32mm	Ametherm	SL32 5R020-B
102	1	T1 (not mounted)	TRANSFORMER FLAT COMPACT		Würth	750317707

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103	104	TP1, TP2, TP3, TP4, TP5, TP6, TP7, TP8, TP9, TP10, TP11, TP12, TP13, TP14, TP15, TP16, TP17, TP18, TP19, TP20, TP21, TP22, TP23, TP24, TP25, TP26, TP27, TP28, TP29, TP30, TP31, TP32, TP33, TP34, TP35, TP36, TP37, TP38, TP39, TP40, TP41, TP42, TP43, TP44, TP45, TP46, TP47, TP48, TP49, TP50, TP51, TP52, TP53, TP54, TP55, TP56, TP57, TP58, TP59, TP60, TP61, TP62, TP63, TP64, TP65, TP66, TP67, TP68, TP69, TP70, TP71, TP72, TP73, TP74, TP75, TP76, TP77, TP78, TP79, TP80, TP81, TP82, TP83, TP84, TP85, TP86, TP87, TP88, TP89, TP90, TP91, TP92, TP93, TP94, TP95, TP96, TP97, TP98, TP99, TP100, TP101, TP102, TP103, TP104	TestPoint_Ring	RS PRO 1mm Black Test Terminal	ANY	ANY
104	7	U10, U12, U13, U1, U3, U5, U8	8MHz, 3 V, 5 V	High Speed, Op Amp, RRIO, 14-Pin SOIC	ST	TSV914IDT
105	4	U11, U14, U15, U7	8MHz, 2.3 - 5.5 V,	High Speed, Op Amp, RRIO, 8-Pin SOIC	ST	TSV912IDT
106	5	U16, U17, U19, U21, U22	-	IC OPAMP ISOLATION 1 CIRC 8SOIC, 8-SOIC (0.295", 7.50mm Width)	Texas Instruments	AMC1301DWVR

Item	Q.ty	Ref.	Part / Value	Description	Manufacturer	Order code
107	2	U18, U23	-	1-Channel DC-DC Power Supply Module 4-Pin, SIP Module	Texas Instruments	DCH010505SN7
108	1	U20	-55 - +130 °C ±1.5°C	Temperature Sensor Analogue, 5-Pin SOT-323, 5-TSSOP, SC-70-5, SOT-353	ST	STLM20W87F
109	6	U24, U25, U26, U27, U28, U29	4A	DGTL ISO single Gate Drive	ST	STGAP2SM
110	4	U2, U4, U6, U9	8MHz, 2.3 - 5.5 V,	High Speed, Op Amp, RRIO, 8-Pin SOIC	ST	TSV912IDT
111	2	U30, U32	800mA	LDO Voltage Regulators Fixed Adjust output very Lo drop, TO-252-3, DPak (2 Leads + Tab), SC-63	ST	LD29080DT50R
112	2	U31, U33	800mA, 0.4 400mV 3.3V	LDO Voltage Regulators VLD Fixed Adj 25c	ST	LD29080S33R
113	1	U34	-	AC-DC Converter 16-Pin, SOIC,	ST	VIPER26HD
114	5	TW1, TW2, TW3, TW4, TW5	-	Spacer Male/ Female M3X10 mm	RS	606-686
115	5	Screw M3 X 6mm	-	Screw M3X6mm	RS	482-8515
116	10	TW6, TW7, TW8, TW9, TW10, TW11, TW12, TW13, TW14, TW15	-	Brass Hex Standoff Male/Female, 40mm, M3 x M3	RS	221-184
117	10	-	-	Brass, Hex Nut, M3	RS	483-0502
118	10	-	-	Plain Stainless Steel Internal Tooth Shakeproof Washer, M3, A4 316	RS	665-7299
119	-	-	-	Nickel Plated Brass Plain Washer, 0.5mm Thickness, M3	RS	483-0631
120	HT1	-	-	HEATSINK AL6063 254X100X27MM	Advantage Thermal Solution	ATS-EXL6-254-R0

**STMicroelectronics****EVALUATION BOARD LICENSE AGREEMENT**

By using this evaluation board or kit (together with all related software, firmware, components, and documentation provided by ST, "Evaluation Board"), You ("You") are agreeing to be bound by the terms and conditions of this Evaluation Board License Agreement ("Agreement"). Do not use the Evaluation Board until You have read and agreed to this Agreement. Your use of the Evaluation Board constitutes Your acceptance of this Agreement.

LICENSE

STMicroelectronics ("ST") grants You the right to use the enclosed Evaluation Board offering limited features only to evaluate and test ST products solely for Your evaluation and testing purposes in a research and development setting. The Evaluation Board shall not be, in any case, directly or indirectly assembled as a part in any production of Yours as it is solely developed to serve evaluation purposes and has no direct function and is not a finished product. If software and/or firmware is accompanied by a separate end user license agreement ("EULA"), then such software and/or firmware shall be governed by such EULA.

EVALUATION BOARD STATUS

The Evaluation Board offers limited features allowing You only to evaluate and test the ST products. The Evaluation Board is not intended for consumer or household use. You are not authorized to use the Evaluation Board in any production system, and it may not be offered for sale or lease, or sold, leased or otherwise distributed for commercial purposes. If the Evaluation Board is incorporated in an evaluation system, the evaluation system may be used by You solely for Your evaluation and testing purposes. Such evaluation system may not be offered for sale or lease or sold, leased or otherwise distributed for commercial purposes and must be accompanied by a conspicuous notice as follows: "This device is not, and may not be, offered for sale or lease, or sold or leased or otherwise distributed for commercial purposes".

OWNERSHIP AND COPYRIGHT

Title to the Evaluation Board remains with ST and/or its licensors. You may not remove any copyright or other proprietary rights notices without prior written authorization from ST. You may make one copy of the software and/or firmware of the Evaluation Board for back up or archival purposes provided that You reproduce and apply to such copy any copyright or other proprietary rights notices included on or embedded in the software and/or firmware. You agree to prevent any unauthorized copying in whole or in part of the Evaluation Board.

RESTRICTIONS AND WARNINGS

Before You handle or use the Evaluation Board, You must carefully review any related documentation provided by ST. Such documentation may contain important warnings. You shall comply with all such warnings and other instructions and employ reasonable safety precautions in using the Evaluation Board. Failure to do so may result in death, personal injury, or property damage. If You have any questions regarding the safe usage of the Evaluation Board, You should contact ST for guidance. You may not sell, assign, sublicense, lease, rent or otherwise distribute the Evaluation Board for commercial purposes, in whole or in part, or use Evaluation Board in a production system, with the exception that if You are an authorized ST distributor, You may resell the Evaluation Board in compliance with the applicable terms and conditions. Except as provided in this Agreement or as explicitly permitted in the documentation of the Evaluation Board, You may not reproduce the Evaluation Board or modify, reverse engineer, de-compile or disassemble its software and/or firmware, in whole or in part. You shall not use the Evaluation Board in any safety critical or functional safety testing, including but not limited to testing of life supporting, military or nuclear applications. ST expressly disclaims any responsibility for such usage which shall be made at Your sole risk, even if ST has been informed in writing of such usage. Unless expressly designated in writing by ST as suitable for use in testing automotive or aerospace applications, You shall not use the Evaluation Board in such testing.

Notice applicable to Evaluation Boards according to European Regulation

For the European Regulation of the Evaluation Board, the applicable EU directives are considered, with a particular attention to the Low Voltage Directive (LVD) 2014/35/EU, the Electromagnetic Compatibility (EMC) Directive 2014/30/EU, and the Radio Equipment Directive (RED) 2014/53/EU. If the Evaluation Board is outside the scope of the foregoing Directives, then the General Product Safety Directive (GPSD) 2001/95/EC and Council Directive 93/68/EEC, amending Directive 73/23/EEC on electrical equipment designed for use within certain voltage limits, are applicable.

The Evaluation Board meets the requirements of the Restriction of Hazardous Substances (RoHS 2 or RoHS recast) Directive 2011/65/EU, Annex II, as amended by Directive 2015/863/EU.

Notice applicable to Evaluation Boards not FCC-Approved

This kit is designed to allow:

- (1) Product developers to evaluate electronic components, circuitry, or software associated with the kit to determine whether to incorporate such items in a finished product and
- (2) Software developers to write software applications for use with the end product.

This kit is not a finished product and when assembled may not be resold or otherwise marketed unless all required FCC equipment authorizations are first obtained. Operation is subject to the condition that this product not cause harmful interference to licensed radio stations and that this product accept harmful interference. Unless the assembled kit is designed to operate under part 15, part 18 or part 95 of 47 CFR, Chapter I ("FCC Rules"), the operator of the kit must operate under the authority of an FCC license holder or must secure an experimental authorization under part 5 of this chapter.

For Evaluation Boards annotated as FEDERAL COMMUNICATIONS COMMISSION (FCC) Part 15 Compliant

- **FCC Interference Statement for Class A Evaluation Boards:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
- **FCC Interference Statement for Class B Evaluation Boards:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
 - Reorient or relocate the receiving antenna.
 - Increase the separation between the equipment and receiver.
 - Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
 - Consult the dealer or an experienced radio/TV technician for help.
- This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

WARRANTY

ST WARRANTS THAT IT HAS THE RIGHT TO PROVIDE THE EVALUATION BOARD TO YOU. THIS WARRANTY IS PROVIDED BY ST IN LIEU OF ALL OTHER WARRANTIES, WRITTEN OR ORAL, STATUTORY, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY AS TO MERCHANTABILITY, NON-INFRINGEMENT, FITNESS FOR ANY PARTICULAR PURPOSE, OR UNINTERRUPTED OR ERROR-FREE OPERATION, ALL OF WHICH ARE EXPRESSLY DISCLAIMED. THE EVALUATION BOARD IS PROVIDED "AS IS".

YOU WARRANT TO ST THAT YOU WILL ENSURE THE EVALUATION BOARD IS USED ONLY BY ELECTRONICS EXPERTS WHO UNDERSTAND THE DANGERS OF HANDLING AND USING SUCH ITEMS, YOU ASSUME ALL RESPONSIBILITY AND LIABILITY FOR ANY IMPROPER OR UNSAFE HANDLING OR USE OF THE EVALUATION BOARD BY YOU, YOUR EMPLOYEES, AFFILIATES, CONTRACTORS, AND DESIGNEES.

LIMITATION OF LIABILITIES

IN NO EVENT SHALL ST BE LIABLE TO YOU, WHETHER IN CONTRACT, TORT (INCLUDING NEGLIGENCE), STRICT LIABILITY, OR ANY OTHER LEGAL THEORY, FOR ANY INDIRECT, SPECIAL, CONSEQUENTIAL, INCIDENTAL, PUNITIVE, OR EXEMPLARY DAMAGES WITH RESPECT TO ANY MATTERS RELATING TO THIS AGREEMENT, REGARDLESS OF WHETHER ST HAS BEEN ADVISED OF THE POSSIBILITY OF THE SAME. IN NO EVENT SHALL ST'S LIABILITY ARISING OUT OF THIS AGREEMENT IN THE AGGREGATE EXCEED THE AMOUNT PAID BY YOU UNDER THIS AGREEMENT FOR THE PURCHASE OF THE EVALUATION BOARD, OR TEN UNITED STATES DOLLARS (\$10.00) IF NO PURCHASE PRICE WAS PAID.

INDEMNIFICATION

You shall, at Your expense, defend ST and its Affiliates against a claim or action brought by a third party for infringement or misappropriation of any patent, copyright, trade secret or other intellectual property right of a third party to the extent resulting from (1) Your combination of the Evaluation Board with any other component, system, software, or firmware, (2) Your modification of the Evaluation Board, or (3) Your use of the Evaluation Board in a manner not permitted under this Agreement. You shall indemnify ST and its Affiliates against and pay any resulting costs and damages finally awarded against ST or its Affiliates or agreed to in any settlement, provided that You have sole control of the defense and settlement of the claim or action, and ST cooperates in the defense and furnishes all related evidence under its control at Your expense. ST will be entitled to participate in the defense of such claim or action and to employ counsel at its own expense.

"Affiliates" means any corporation or other entity directly or indirectly controlled by, controlling or under common control with the entity in question, for so long as such ownership exists. "Control" means the direct or indirect beneficial ownership of more than fifty (50%) percent of the stock or other equity interests entitled to vote for the election of directors or an equivalent governing body. Any such corporation or other legal entity shall be deemed to be an Affiliate of such Party only as long as such Control exists.

TERMINATION

ST may terminate this Agreement without notice if You breach this Agreement. Upon termination, You shall immediately destroy or return all copies of the software, firmware, and documentation of the Evaluation Board to ST and certify in writing to ST that You have done so.

APPLICABLE LAW AND JURISDICTION

This Agreement shall be governed, construed and enforced in accordance with the laws of Switzerland, without regard to its conflict of laws rules. The UN Convention on Contracts for the International Sale of Goods shall not apply to this Agreement. In case of dispute and in the absence of an amicable settlement, the only competent jurisdiction shall be the Courts of Geneva, Switzerland. Any breach of this Agreement by You may result in irreparable damage to ST for which ST will not have an

adequate remedy at law. Accordingly, in addition to any other remedies and damages available, You acknowledge and agree that ST may immediately seek enforcement of this Agreement in any jurisdiction by means of specific performance or injunction, without any requirement to post a bond or other security.

SEVERABILITY

If any provision of this agreement is or becomes, at any time or for any reason, unenforceable or invalid, no other provision of this agreement shall be affected thereby, and the remaining provisions of this agreement shall continue with the same force and effect as if such unenforceable or invalid provisions had not been inserted in this Agreement. In addition, any unenforceable or invalid provision shall be deemed replaced by a provision that is valid and enforceable and that comes closest to expressing the intention of the unenforceable or invalid provision.

WAIVER

The waiver by either party of any breach of any provision of this Agreement shall not operate or be construed as a waiver of any other or a subsequent breach of the same or a different provision.

RELATIONSHIP OF THE PARTIES

Nothing in this Agreement shall create, or be deemed to create, any joint venture, partnership, principal-agent, employer-employee or other relationship between the Parties, except that of independent contractors. Neither Party has the authority or power to bind, to contract in the name of, or to create a liability for the other in any way or for any purpose.

SURVIVAL

Any provision of this Agreement which imposes an obligation after termination of this Agreement shall survive the termination of this Agreement.

SECTION HEADINGS

Section headings are inserted for convenience only and shall not be used to interpret this Agreement.

WASTE AND RECYCLING

The Evaluation Board is not to be disposed of as urban waste. At the end of its life cycle, differentiated waste collection must be followed. Consult the local authorities for more information on the proper disposal channels. It is mandatory to separately collect the Evaluation Board and make sure it is delivered to the appropriate waste management and recycling centers.

As of 15 August 2018, in all the countries belonging to the European Union, the Evaluation Board is subject to the WEEE Directive 2012/19/EU requirement; therefore, it is forbidden to dispose of the Evaluation Board as undifferentiated waste or with other domestic wastes. Consult the local authorities for more information on the proper recycling centers.

Disposing of the Evaluation Board incorrectly may cause damage to the environment and may be subject to fines based on specific countries' rules.