

Bill of materials

Table 1. STEVAL-ASTRA1B bill of materials

Item	Q.ty	Ref.	Part/value	Description	Manufacturer	Order code
1	1	Table 2. STEVAL-ASTRA1	-	Main board	ST	Not available for separate sale
2	1	Table 3. STEVAL-ASTRA1SB	-	System on board	ST	Not available for separate sale
3	1	Table 4. STEVAL-ASTRA1BC	-	Expansion board	ST	Not available for separate sale
4	1	Table 5. STEVAL-ASTRA1NA	-	Flexible antenna	ST	Not available for separate sale
5	1	Plastic case	-	Plastic case	-	-
6	1	Antenna	-	SMA antenna	LPRS	ANT-SS900
7	1	Battery	3.7 V, 480 mAh	LiPo battery	Himax	LiPO-752535
8	2	Screws	M2 stainless steel, 4 mm	Conical head metric screws	RS PRO	914-1462
9	1	Screw	M2 stainless steel, 8 mm	Conical head metric screw	RS PRO	914-1475
10	1	Cable tie mount	Black, ABS, 4.2 mm x 4.2 mm	4-way adhesive backed cable tie mount	Panduit	ABM2S-A-C0
11	1	Cable tie	Nylon, 200 mm x 4.7 mm	Releasable nylon cable tie	Hellermann Tyton	115-40200 REZ200-PA66-BK

Table 2. STEVAL-ASTRA1 bill of materials

Item	Q.ty	Ref.	Part/value	Description	Manufacturer	Order code
1	1	C100	56 pF SMD 0201 50 V $\pm 5\%$ COG	Ceramic capacitor	Murata Electronics	GRM0335C1H560JA01D
2	1	C101	10 nF SMD 0201 10 V $\pm 10\%$ X7R	Ceramic capacitor	Murata Electronics	GRM033R71A103KA01J
3	4	C102 C103 C104 C105	56 pF 0201 50 V $\pm 5\%$ COG	Ceramic capacitors (not mounted)	Murata Electronics	GRM0335C1H560JA01D
4	1	C106	1 nF SMD 0201 50 V $\pm 10\%$ X7R	Ceramic capacitor	Murata Electronics	GRM033R71H102KA12J
5	2	C107 C108	120 pF SMD 0201 50 V $\pm 5\%$	Ceramic capacitors	Murata Electronics	GRM0335C1H121JA01D
6	13	C200 C201 C202 C203 C204 C205 C206 C500 C501 C503 C600 C601 C800	100 nF SMD 0201 10 V 20% X5R	Ceramic capacitors	Murata Electronics	GRM033R61A104ME15D
7	2	C300 C303	10 μ F 0603 (1608 Metric) 6.3 V $\pm 20\%$ X5R	Ceramic capacitors	TDK Corporation	C1608X5R0J106M080AB
8	2	C301 C302	47 μ F SMD 0805 (2012 Metric) 6.3 V $\pm 20\%$ X5R	Ceramic capacitors	Yageo	CC0805MKX5R5BB476

Item	Q.ty	Ref.	Part/value	Description	Manufacturer	Order code
9	1	C502	100 nF SMD 0201 10 V 20% X5R	Ceramic capacitor (not mounted)	Murata Electronics	GRM033R61A104ME15D
10	1	D401	STPS120MF DO-222AA 490 mV at 1 A STmiteFLAT	20 V, 1 A STmiteFLAT power Schottky rectifier	ST	STPS120MF
11	1	D402	STPS1L30MF DO-222AA 390 mV at 1 A STmiteFLAT	30 V, 1 A STmiteFLAT low drop power Schottky rectifier	ST	STPS1L30MF
12	2	D500 D501	ESDALC6V1-1U2 0201 (0603 Metric)	Single-line low capacitance Transil for ESD protection	ST	ESDALC6V1-1U2
13	1	D502	Led_RGB 0404 (1010 Metric) 5 mA red, 5 mA green, 5 mA blue WL-SFCC SMT	Full-color chip LED	Würth Elektronik	150044M155260
14	4	D902 D903 D904 D905	BAT30F4 0201 (0603 Metric) 300 mA	30 V, 300 mA CSP general purpose small signal Schottky diode	ST	BAT30F4
15	1	J100	1.56/1.575 GHz ceramic	RF antenna	Taoglas Limited	CGGBP.18.4.A.02
16	1	J101	UFL Wurth_636101111 001 U.FL-R- SMT-1	WR-UMRF_PCB RECEPTACLE_S MT_3 PAD (not mounted)	Würth Elektronik	636101111001
17	1	J102	CON-SMA- R_A_SMD	CONN SMA REC R/A T&R (not mounted)	Linx Technologies Inc.	CONSMA002-SMD-G-T
18	5	J400 J404 J405 J407 J408	CON 3 Strip 1.27 mm vertical	Connector headers	Harwin Inc.	M50-3530342
19	1	J401	78171-0003	Headers and wire housings	Molex	78171-0003
20	1	J402	Con3_Strip_Male _1.27 mm 3 positions	Connector header	Harwin Inc.	M50-3930342
21	2	J409 J410	0 R 0603 1/10 W ±1% SMD	Resistors	Vishay	CRCW06030000Z0EB
22	1	J411	CON34-Socket 34 positions	Connector socket	Panasonic Electric Works	AXF5G3412A
23	1	J421	con1-strip-male 50 Pitch 90 1.27 mm 2 positions	Connector header	Harwin Inc.	M50-3930242
24	1	J422	CON 3 Strip 1.27 mm 3 positions	Connector header	Harwin Inc.	M50-3530342
25	6	J423 J424 J425 J426 J427 J428	Jumper-Female 1.27 mm	Jumpers	Sullins Connector Solutions	NPB02SVAN-RC
26	1	J502	SOLDER JUMPER3 0603	Tin drop jumper (not mounted)	Yageo	RC0603JR-070RL

Item	Q.ty	Ref.	Part/value	Description	Manufacturer	Order code
			(3 pin drop) 1/10 W $\pm 1\%$			
27	1	J503	CON5 Female 1.27 mm	Headers and wire housings (not mounted)	Preci-dip	851-87-005-40-252101
28	1	J600	Con 4 X 0.5 mm FFC-FPC 4 positions	Connector	Molex	5034800400
29	2	J900 J901	0 R 0603 1/10 W $\pm 1\%$	Resistor	Vishay	CRCW06030000Z0EB
30	2	J930 J931	CON 22 Header 22 positions 1.27 mm SMD	Connector headers (not mounted)	Samtec Inc.	FTSH-111-01-L-DV-K-P-TR
31	1	L100	27 nF 0603 (16085 Metric) 300 mA $\pm 5\%$	Inductor	Würth Elektronik	7447860127
32	1	L102	5.6 nH 0402 (1005 Metric) 1.77 A $\pm 3\%$ SMD	Inductor	Murata Electronics	LQW15AN5N6G80D
33	1	L103	100 nH 0402 (1005 Metric) 200 mA $\pm 5\%$ SMD	Inductor (not mounted)	Murata Electronics	LQG15HNR10J02D
34	2	L300 L301	2.2 μ H 0806 (2016 Metric) $\pm 20\%$	Fixed inductors	Würth Elektronik	74479776222
35	1	Q300	VT6M1T2 6-SMD, flat leads 120 mW 20 V 0.1 A N/P-CH VMT6	MOSFET	Rohm Semiconductor	VT6M1T2CR
36	1	Q400	STL4P3LLH6 PowerFLAT 2x2	P-channel 30 V, 0.048 ohm typ., 4 A STripFET H6 Power MOSFET in PowerFLAT 2x2 package	ST	STL4P3LLH6
37	3	Q501 Q504 Q505	RV3C002UN 3-XFDFN 100 mW (Ta) 20 V 150 MA SM SIG VML	NCH MOSFET	Rohm Semiconductor	RV3C002UNT2CL
38	1	Q502	VT6X1T2R VMT-6 BJT TR NPNX2 20V VCEO	Bipolar transistor	Rohm Semiconductor	VT6X1T2R
39	1	Q503	2SCR522MT2L SOT-723 150 mW NPN 20 V 0.2 A VMT3	Transistor	Rohm Semiconductor	2SCR522MT2L
40	30	R100 R101 R102 R304 R308 R309 R500 R501 R504 R513 SB200 SB204 SB205 SB206 SB207 SB208 SB209 SB210 SB212 SB213 SB300 SB305 SB306 SB600 SB939 SB940 SB941 SB942 SB943 SB944	0 R 0201 1/20 W $\pm 1\%$ SMD	Resistors	Stackpole Electronics	RMCF0201ZT0R00
41	13	R103 R200 R400 R502 R503 R518	10k 0201 1/20 W $\pm 1\%$	Resistors	Yageo	RC0201FR-0710KL

Item	Q.ty	Ref.	Part/value	Description	Manufacturer	Order code
		R600 R800 R801 R914 R915 R916 R917				
42	11	R104 R105 R305 R521 SB201 SB211 SB214 SB308 SB934 SB935 SB938	0R 0201 1/20 W ±1%	Resistors (not mounted)	Stackpole Electronics	RMCF0201ZT0R00
43	7	R201 R300 R311 R515 R519 R522 R523	1M 0201 1/20 W ±1%	Resistors	Yageo	RC0201FR-071ML
44	2	R301 R307	100 K 0201 1/20 W ±1%	Resistors	Yageo	RC0201FR-07100KL
45	1	R302	5.6 K 0201 1/20 W ±1%	Resistor	Panasonic Electronics	ERJ-1GNF5601C
46	1	R303	3 K 0201 1/20 W ±1%	Resistor	Panasonic Electronics	ERJ-1GEF3001C
47	1	R310	1 M 0201 1/20 W ±1%	Resistor (not mounted)	Yageo	RC0201FR-071ML
48	1	R401	5.6 K 0201 1/20 W ±1%	Resistor	Panasonic Electronics	ERJ-1GNF5601C
49	2	R402 R512	1 k 0201 1/20 W ±1%	Resistors	Panasonic Electronic	ERJ-1GEF1001C
50	1	R506	20 R 0201 1/20 W ±5%	Resistor	Panasonic Electronic	ERJ-1GNJ200C
51	1	R507	82 R 0201 1/20 W ±5%	Resistor	Panasonic Electronic	ERJ-1GNJ820C
52	1	R508	33 R 0201 1/20 W 1%	Resistor	Panasonic Electronics	ERJ-1GNJ330C
53	1	R509	30 k 0201 1/20W ±1%	Resistor	Yageo	RC0201FR-0730KL
54	1	R510	120 k 0201 1/20 W ±1%	Resistor	Panasonic Electronic	ERJ-1GNF1203C
55	1	R511	51 k 0201 1/20 W ±1%	Resistor	Panasonic Electronic	ERJ-1GEF5102C
56	3	S1 S2 S3	Spacer_1.5 mm	RND standoff	Würth Elektronik	9774015243R
57	9	SB100 SB101 SB102 SB103 SB104 SB301 SB302 SB303 SB307	0 R 0603 1/10 W ±1%	Jumpers	Yageo	RC0603JR-070RL
58	2	SB202 SB203	0 R 0603 1/10 W ±1%	Jumpers	Yageo	RC0603JR-070RL
59	1	SB400	0 R 0603 1/10 W ±1%	Jumper	Yageo	RC0603JR-070RL
60	1	SB403	0 R 0603 1/10 W ±1%	Jumper (not mounted)	Yageo	RC0603JR-070RL
61	4	SB500 SB501 SB800 SB801	0 R 0603 1/10 W ±1%	Jumper	Yageo	RC0603JR-070RL
62	1	SB601	0 R 0603 1/10 W ±1%	Jumper	Yageo	RC0603JR-070RL
63	1	SW500	Switch	Switch	TE Connectivity	-
64	1	SW501	Push- Bottom_WE4343 31013822	Tactile switch	Würth Elektronik	434331013822

Item	Q.ty	Ref.	Part/value	Description	Manufacturer	Order code
			3.50mm x 2.90mm SPST- NO 0.05 A 12 V			
65	12	TP100 TP101 TP200 TP201 TP202 TP204 TP205 TP206 TP208 TP500 TP600 TP601	TP	Test points	Any	Any
66	66	TPB209 TPB210 TPB221 TPB222 TPB223 TPB224 TPB225 TPB226 TPB227 TPB228 TPB229 TPB230 TPB231 TPB232 TPB233 TPB234 TPB235 TPB236 TPB237 TPB238 TPB239 TPB240 TPB241 TPB242 TPB243 TPB244 TPB245 TPB246 TPB247 TPB248 TPB249 TPB250 TPB251 TPB252 TPB253 TPB254 TPB255 TPB256 TPB257 TPB258 TPB259 TPB260 TPB261 TPB262 TPB263 TPB264 TPB265 TPB266 TPB267 TPB268 TPB269 TPB270 TPB271 TPB272 TPB273 TPB274 TPB275 TPB276 TPB277 TPB278 TPB279 TPB280 TPB281 TPB282 TPB283 TPB284	TPB	Not mounted	-	-
67	56	TPE133 TPE134 TPE145 TPE167 TPE168 TPE173 TPE174 TPE175 TPE176 TPE177 TPE700 TPE701 TPE702 TPE703 TPE704 TPE705 TPE706 TPE707 TPE708 TPE709 TPE710 TPE711 TPE712 TPE713 TPE714 TPE715 TPE716 TPE717 TPE718 TPE719 TPE720 TPE721 TPE722 TPE723 TPE724 TPE725 TPE726 TPE727 TPE728 TPE729 TPE730 TPE732 TPE734 TPE736 TPE739 TPE740 TPE741 TPE742 TPE743 TPE744 TPE745 TPE746	TPE	Not mounted	-	-

Item	Q.ty	Ref.	Part/value	Description	Manufacturer	Order code
		TPE747 TPE749 TPE752 TPE754				
68	1	U100	Teseo-LIV3F 9.7X10.1mm	Tiny GNSS module	ST	Teseo-LIV3F
69	1	U101	BGA725L6E6327 FTSA1 6-XFDN 1.55-1.615 GHZ TSLP6-2	IC AMP GPS	Infineon Technologies	BGA725L6E6327FTSA1
70	1	U102	B39162B4327P8 10 5-SMD, No Lead	Filter	Qualcomm (RF360 - A Qualcomm & TDK Joint Venture)	B39162B4327P810
71	1	U200	LIS2DTW12TR LGA2X2X0.7 12 leads	MEMS digital output dual motion and temperature sensor	ST	LIS2DTW12TR
72	1	U201	STTS22HTR UDFN 2X2X.55 6L PITCH 0.65	Low-voltage, ultra-low-power, 0.5°C accuracy I ² C/SMBus 3.0 temperature sensor	ST	STTS22HTR
73	1	U202	LSM6DSO32X VFLGA2.5X3X.86 14L P.5 L.475X.25	iNEMO inertial module: always- on 3D accelerometer and 3D gyroscope	ST	LSM6DSO32XTR
74	1	U203	LPS22HH HLGA 2X2X.8 10L EXP.SILIC.91SQ	High-performance MEMS nano pressure sensor: 260-1260 hPa absolute digital output barometer	ST	LPS22HHTR
75	1	U204	HTS221TR HLGA-6L 2X2X0.9	Capacitive digital sensor for relative humidity and temperature	ST	HTS221TR
76	1	U300	ST1PS02CQTR MLPQ/QFN 1.7x2.0x0.55 12L P0.4	400 mA nano-quiescent synchronous step-down converter with digital voltage selection, power good and AUX switch	ST	ST1PS02CQTR
77	1	U500	74LVC1G74GT 8- XFDN	IC FF D-TYPE SNGL 1BIT 8XSON	Nexperia USA Inc.	74LVC1G74GT,115
78	1	U600	ST25DV64K- JFR6D3 UDFPN 12L 3X3X0.55 Pitch 0.50	Dynamic NFC/ RFID tag IC with 64-Kbit EEPROM and fast transfer mode capability	ST	ST25DV64K-JFR6D3
79	1	U800	STSafa110DFS PL02 UDFPN 8 2x3x0.6	Authentication, state-of-the-art security for	ST	STSafa110DFSPL02

Item	Q.ty	Ref.	Part/value	Description	Manufacturer	Order code
				peripherals and IoT devices (not mounted)		
80	1	-	FR4-IT180A-4 layers 58.29x43.3x1.38 mm, laser drill between layers 1 and 2	PCB	-	-

Table 3. STEVAL-ASTRA1SB bill of materials

Item	Q.ty	Ref.	Part/value	Description	Manufacturer	Order code
1	1	C900	100 nF 0201 10 V ±20% X5RSMD	Ceramic capacitor (not mounted)	Murata Electronics	GRM033R61A104ME15D
2	1	C901	22 µF 0603 (1608 Metric) 16 V ±20% X5R SMD	Ceramic capacitor	Samsung Electro-Mechanics	CL10A226MO7JZNC
3	2	C902 C903	10 µF 0805 (2012 Metric) 16 V ±10% X5R	Ceramic capacitors	Murata	GRM21BR61C106KE15L
4	1	C904	10 µF 0603 (1608 Metric) 6.3 V ±20%	Ceramic capacitor	TDK Corporation	C1608X5R0J106M080AB
5	13	C905 C906 C918 C919 C921 C922 C926 C927 C928 C929 C931 C936 C940	100 nF 0201 10 V ±20%	Ceramic capacitors	Murata Electronics	GRM033R61A104ME15D
6	10	C907 C908 C909 C910 C911 C912 C913 C914 C915 C916	3 pF 0201 25 V ±10% COGSMD	Ceramic capacitors	Murata Electronics	GRM0335C1E3R0CA01D
7	1	C917	10 µF 0603 (1608 Metric) 10 V ±20% solid SMD	Tantalum capacitors	Vishay	TR8M106M0102T2000
8	2	C920 C925	4.7 µF 0201 6.3 V ±20% X5RSMD	Ceramic capacitors	Murata Electronics	GRM035R60J475ME15D
9	2	C923 C930	5.3 pF 0402 (1005 Metric) 50 V 0.1 pF COG SMD	Ceramic capacitors	Murata Electronics	GCQ1555C1H5R3BB01D
10	1	C932	47 pF 0201 25 V ±5% COG SMD	Ceramic capacitor	Murata Electronics	GRM0335C1E470JA01J
11	3	C933 C934 C935	33 pF 0201 50 V ±5% COGSMD	Ceramic capacitors	Murata Electronics	GRM0335C1H330JA01D
12	1	C937	47 pF 0201 25 V ±5% SMDX5R	Ceramic capacitor	Murata Electronics	GRM0335C1E470JA01J
13	1	C938	470 nF 0402 (1005 Metric) 10 V ±10% X5R	Ceramic capacitor	Yageo	CC0402KRX5R6BB474
14	1	C939	10 pF 0402 (1005 Metric) 50 V ±5% COG	Ceramic capacitor	Kemet	C0402C100J5GACTU
15	3	C941 C943 C946	1 nF 0201 50 V ±10% X7RSMD	Ceramic capacitors	Murata Electronics	GRM033R71H102KA12D

Item	Q.ty	Ref.	Part/value	Description	Manufacturer	Order code
16	1	C942	2.2 pF 0402 (1005 Metric) 50 V 0.05 pF	Ceramic capacitor	Murata Electronics	GJM1555C1H2R2WB01D
17	1	C949	1.5 pF 0402 (1005 Metric) 50 V 0.05 pF COG	Ceramic capacitor	Murata Electronics	GJM1555C1H1R5WB01D
18	5	C944 C945 C953 C954 C961	33 pF 0402 (1005 Metric) 50 V $\pm 1\%$ COG	Ceramic capacitors	Murata Electronics	GJM1555C1H330FB01D
19	1	C947	6.2 pF 0402 (1005 Metric) 50 V 0.05 pF COG	Ceramic capacitor	Murata Electronics	GJM1555C1H6R2WB01D
20	1	C948	4.3 pF 0402 (1005 Metric) 50 V 0.05 pF COG	Ceramic capacitor	Murata Electronics	GJM1555C1H4R3WB01D
21	1	C950	47 nF 0201 16 V $\pm 10\%$ X5R	Ceramic capacitor	Murata Electronics	GRM033R61C473KE84D
22	1	C951	68 pF 0201 50 V $\pm 5\%$ COG SMD	Ceramic capacitor	Murata Electronics	GRM0335C1H680JA01D
23	2	C952 C966	2.7 pF 0402 (1005 Metric) 50 V ± 0.1 pF COG	Ceramic capacitors	Yageo	CC0402BRNPO9BN2R7
24	1	C955	5.6 pF 0402 (1005 Metric) 50 V ± 0.25 pF COG	Ceramic capacitor	Murata Electronics	GRM1555C1H5R6BA01D
25	3	C956 C962 C964	3.3 pF 0402 (1005 Metric) 50 V ± 0.05 pF COG	Ceramic capacitors	Murata Electronics	GJM1555C1H3R3WB01D
26	1	C957	1.3 pF 0402 (1005 Metric) 50 V ± 0.05 pF COG	Ceramic capacitor	Murata Electronics	GJM1555C1H1R3WB01D
27	1	C963	3.6 pF 0402 (1005 Metric) 50 V ± 0.05 pF COG	Ceramic capacitor	Murata Electronics	GJM1555C1H3R6WB01D
28	1	C965	1 pF 0402 (1005 Metric) 50V ± 0.1 pF COG	Ceramic capacitor (not mounted)	AVX Corporation	04025A1R0BAT2A
29	4	CL1 CL2 CL3 CL4	Clip-0951-46R SMD	RFI shield clip compact tins	Harwin Inc.	S0951-46R
30	2	D900 D901	BAT30F4 0201 (0603 Metric) 300 mA ST0201	30 V, 300 mA CSP general purpose small signal Schottky diode	ST	BAT30F4
31	1	D902	Led_RGB 0404 (1010 Metric) 5 mA red, 5 mA green, 5 mA blue WL-SFCC SMT	Full-color chip LED	Würth Elektronik	150044M155260
32	30	J900 J901 J902 J903 J904 J905 J906 J907 J908 J909 J910 J911 J912 J913 J914 J915 J916 J917 J918 J919 J920 J921 J922 J923	0 0402	Tin drop jumpers (not mounted)	-	-

Item	Q.ty	Ref.	Part/value	Description	Manufacturer	Order code
		J924 J925 J926 J927 J928 J929				
33	2	J930 J931	CON 22 positions 1.27 MMSMD	Connector headers (not mounted)	Samtec Inc.	FTSH-111-01-L-DV-K-P-TR
34	2	J932 J933	NX3L1T3157GM 6-XDFDN	IC SWITCH SPDT 6XSON	NXP USA Inc.	NX3L1T3157GM,132
35	1	J935	CON_SMA_Wurt h_603122021145 08	SMA PCB end launch jack	Würth Elektronik	60312202114508
36	1	J936	UFL Wurth_636101111 001 U.FL-R- SMT-1	WR-UMRF_PCB RECEPTACLE_S MT_3 PAD (not mounted)	Würth Elektronik	636101111001
37	1	J937	0 R 0603 1/10 W ±1%	Resistor	Vishay	CRCW06030000Z0EB
38	1	L900	2.2 µH 1.2 A 0806 (2016 Metric) ±20%	Fixed inductor	Würth Elektronik	74479776222
39	1	L901	2.2 µH 1.2A 0806 (2016 Metric) ±20%	Fixed inductor	Würth Elektronik	74479776222
40	1	L902	600 ohm at 100 MHz 0603 (16085 Metric) 300 mA SMD	Inductor	Chilisin Electronics	BBBK00160808601Y00
41	1	L903	15 µH 0603 (16085 Metric) 250 mA SMD	Inductor	TDK Corporation	MLZ1608N150LT000
42	1	L904	1 kohm 100 MHz 0402 (1005 Metric) 250 mA SMD	Inductor	Murata Electronics	BLM15HG102SN1D
43	2	L905 L912	3.3 nH 0402 (1005 Metric) 2 A ±0.1 nH SMD	Inductors	Murata Electronics	LQW15AN3N3B80D
44	2	L907 L908	47 nH 0402 (1005 Metric) 210 mA SMD	Inductors	Murata Electronics	LQW15AN47NJ00D
45	1	L909	3 nH 0402 (1005 Metric) 1.35 A SMD	Inductor	Murata Electronics	LQW15AN3N0C80D
46	3	L906 L910 L913	8.7 nH 0402 (1005 Metric) 1.42 A ±2%	Inductors	Murata Electronics	LQW15AN8N7G80D
47	1	L911	2.5 nH 0402 (1005 Metric) 1 A SMD	Inductor	Murata Electronics	LQW15AN2N5B80D
48	1	L914	11 nH 0402 (1005 Metric) 500 mA SMD	Inductor	Murata Electronics	LQW15AN11NG00D
49	1	Q1	VT6X1T2R VMT-6	Bipolar Transistors - BJT TR NPNX2 20V VCEO	Rohm Semiconductor	VT6X1T2R

Item	Q.ty	Ref.	Part/value	Description	Manufacturer	Order code
50	1	Q2	2SCR522MT2L SOT-723 150 mW 20 V 0.2 A VMT3	NPN transistor	Rohm Semiconductor	2SCR522MT2L
51	4	R900 R909 R910 R911	100 R 0201 1/20 W ±1%	Resistors	Panasonic	ERJ1GNF1000C
52	3	R901 R924 R930	1 M 0201 1/20 W ±1%	Resistors	Yageo	RC0201FR-071ML
53	3	R902 R903 R904	10 k 0201 1/20 W ±1%	Resistors	VISHAY	CRCW020110K0FKED
54	31	R905 R906 R913 R914 R915 R916 SB900 SB901 SB902 SB904 SB905 SB906 SB907 SB908 SB909 SB910 SB911 SB912 SB913 SB918 SB922 SB923 SB924 SB925 SB926 SB927 SB928 SB929 SB931 SB940 SB941	0 R 0201 1/20 W ±1%	Resistors	Stackpole Electronics	RMCF0201ZT0R00
55	1	R908	220 R 0201 1/20 W ±1%	Resistor	Yageo	RC0201FR-07220RL
56	1	R917	30 k 0201 1/20 W ±1%	Resistor	Yageo	RC0201FR-0730KL
57	1	R918	120 k 0201 1/20 W ±1%	Resistor	Panasonic Electronic	ERJ-1GNF1203C
58	1	R919	51 k 0201 1/20 W ±1%	Resistor	MULTICOMP	ERJ-MCRE000181
59	1	R920	20 R 0201 1/20 W ±1%	Resistor	Panasonic Electronic	ERJ-1GNJ200C
60	1	R921	0 R 0402 (1005 Metric) 1/16 W 1± %	Chip resistor	Yageo	RC0402JR-070RL
61	1	R922	33 R 0201 1/20 W ±1%	Resistor	Panasonic Electronics	ERJ-1GNJ330C
62	2	R925 R926	100 k 0201 1/20 W ±1%	RES SMD 1% 1/20W 0201	Multicomp	MCRE000188
63	1	R923	1 M 0201 1/20 W ±1%	Resistor (not mounted)	Yageo	RC0201FR-071ML
64	1	R927	82 R 0201 1/20 W ±5%	Resistor	Panasonic Electronics	ERJ-1GNJ820C
65	7	SB903 SB915 SB916 SB920 SB921 SB930 SB932	0 R 0201 1/20 W ±1%	Resistor (not mounted)	Stackpole Electronics	RMCF0201ZT0R00
66	1	SH1	Shield MS190-10S 19 X 13.9 X 2MM	EMI/RF shield	Masach Tech Ltd.	MS190-10S
67	1	TP900	TP	Test point (not mounted)	-	-
68	1	TP901	TP	Test point (not mounted)	-	-
69	66	TPB900 TPB901 TPB902 TPB903 TPB904 TPB905	TPB	Test points (not mounted)	-	-

Item	Q.ty	Ref.	Part/value	Description	Manufacturer	Order code
		TPB906 TPB907 TPB908 TPB909 TPB910 TPB911 TPB912 TPB913 TPB914 TPB915 TPB916 TPB917 TPB918 TPB919 TPB920 TPB921 TPB922 TPB923 TPB924 TPB925 TPB926 TPB927 TPB928 TPB929 TPB930 TPB931 TPB932 TPB933 TPB934 TPB935 TPB936 TPB937 TPB938 TPB939 TPB940 TPB941 TPB942 TPB943 TPB944 TPB945 TPB946 TPB947 TPB948 TPB949 TPB950 TPB951 TPB952 TPB953 TPB954 TPB955 TPB956 TPB957 TPB958 TPB959 TPB960 TPB961 TPB962 TPB963 TPB964 TPB965				
70	56	TPE130 TPE131 TPE132 TPE133 TPE134 TPE148 TPE149 TPE150 TPE151 TPE152 TPE900 TPE901 TPE902 TPE903 TPE904 TPE905 TPE906 TPE907 TPE908 TPE909 TPE910 TPE911 TPE912 TPE913 TPE914 TPE915 TPE916 TPE917 TPE918 TPE919 TPE920 TPE921 TPE922 TPE923 TPE924 TPE925 TPE926 TPE927 TPE928 TPE930 TPE932 TPE934 TPE936 TPE943 TPE944 TPE945 TPE946 TPE947 TPE948 TPE949 TPE950 TPE951 TPE952 TPE953 TPE954 TPE955	TPE	Test points (not mounted)	-	-
71	2	FB1 FB2	470 ohms at 100 MHz 0201 (0603 Metric) 1LN	Ferrite beads	Murata Electronics	BLM03BD471SN1D
72	1	U900	ST1PS02CQTR MLPQ/QFN 1.7x2.0x0.55 12L P0.4	400 mA nano-quiescent synchronous step-down converter with	ST	ST1PS02CQTR

Item	Q.ty	Ref.	Part/value	Description	Manufacturer	Order code
				digital voltage selection, Power Good and AUX switch		
73	1	U901	STSAFA110DFS PL02 UFDFPN 8 2x3x0.6	Authentication, state-of-the-art security for peripherals and IoT devices	ST	STSAFA110DFSPL02
74	1	U902	STM32WB5MMG H6TR SIP LGA 86 7.3x11 mm	Ultra-low-power module dual core Arm® Cortex®-M4 MCU 64 MHz, Arm® Cortex®-M0+ 32MHz with 1 Mbyte of Flash memory, Bluetooth LE 5.2, 802.15.4, Zigbee, Thread, USB, LCD, AES-256	ST	STM32WB5MMGH6TR
75	1	U903	STM32WL55JCI7 UFBGA 73 5x5x0.6 P 0.5 mm	Dual-core Arm® Cortex®-M4/M0+ at 48 MHz with 256 Kbytes of Flash memory, 64 Kbytes of SRAM, LoRa, (G)FSK, (G)MSK, BPSK modulations, AES 256-bit, multiprotocol system-on-chip	ST	STM32WL55JCI7
76	1	U904	BGS13SN8 8- XFQFN SP3T TSNP8-1	IC RF switch	Infineon Technologies	BGS13SN8E6327XTSA1
77	1	Y900	32.768 kHz 2- SMD, no lead	Crystal	NDK America, Inc.	NX2012SA-32.768KHZ-EXS00A-MU00527
78	1	Y901	32 MHz 4-SMD, no lead	XTAL OSC VCTCXO 32.0000 MHz SMD	NDK America, Inc.	NT2016SA-32M-END4263A
79	1	-	PCB-IT180 FR4- IT180, 6 LAYER-38x28x1. 1 mm	PCB with vias blind/microvias	-	-

Table 4. STEVAL-ASTRA1BC bill of materials

Item	Q.ty	Ref.	Part/value	Description	Manufacturer	Order code
1	3	C1 C203 C300	100 nF 0201 10 V ±20% X5R SMD	Ceramic capacitors	Murata Electronics	GRM033R61A104ME15D
2	1	C200	1 µF 0201 6.3 V ±20% X5R SMD	Ceramic capacitor	Murata Electronics	GRM033R60J105MEA2D
3	2	C201 C202	10 µF 0603 (1608 Metric) 6.3 V ±20% X5R	Ceramic capacitors	TDK Corporation	C1608X5R0J106M080AB
4	1	C204	4.7 µF 0201 6.3 V ±20% X5R	Ceramic capacitor	Murata Electronics	GRM035R60J475ME15D

Item	Q.ty	Ref.	Part/value	Description	Manufacturer	Order code
5	1	CN200	WE-63272330001 1 THT/SM	USB 3.1 Type-C receptacle	Würth Elektronik	632723300011
6	1	D1	ESDALC6V1 DFN2 0201 (0603 Metric)	Single-line low capacitance Transil for ESD protection	ST	ESDALC6V1-1U2
7	1	D200	Led Yellow 0402 (1005 Metric) * *	DIODE LED SMD 0402 Yellow	Würth Elektronik	150040YS73240
8	1	D201	ESDA7P60 QFN-2L	High-power transient voltage suppressor	ST	ESDA7P60-1U1M
9	1	D202	BAT30F4 (0603 Metric) 300 mA ST0201	30 V, 300 mA CSP general purpose small signal Schottky diode	ST	BAT30F4
10	1	D203	LED RED 0402 (1005 Metric) 20 mA	Red LED	Würth Elektronik	150040RS73240
11	1	IC200	ECMF02_2AMX6 QFN-6L 200 mA	Common-mode filter and ESD protection for USB 2.0 and MIPI/MDDI interfaces	ST	ECMF02-2AMX6
12	5	J100 J101 J102 J103 J104	Con3_Strip_Male_SMD SMD 3POS 1.27 mm	Connector headers	Sullins Connector Solutions	GRPB031VWTC-RC
13	1	J105	con4-strip-male	Connector header (not mounted)	Würth Elektronik	61300411121
14	1	J106	con2-strip-female 50 pitch	Connector receptacle	Harwin Inc.	M50-3030242
15	5	J107 J108 J109 J110 J111	Jumper-Female 1.27 mm	Jumpers	Sullins Connector Solutions	NPB02SVAN-RC
16	1	J200	78171-0003	Headers and wire housing	Molex	78171-0003
17	1	J201	Con1X3 Female 1.27 mm	Connector receptacle	Harwin Inc.	M50-3030342
18	1	J300	Con14-male 1.27 mm	Connector header	Samtec Inc.	FTSH-107-01-F-DV-K-P-TR
19	1	J400	STMod-Female 2x10 2mm SMD	Connector receptacle	Harwin Inc.	M22-6551042R
20	1	J401	0 ohm ±1% 0603 (3pin drop) 0.1 W, 1/10 W SMD	Chip resistor	Vishay	CRCW06030000Z0EB
21	1	J500	CON34-Header	Connector header	Panasonic Electric Works	AXF6G3412A
22	1	J501	CON34-Socket	Connector socket	Panasonic Electric Works	AXF5G3412A
23	1	Q200	STL6N3LLH6 PowerFLAT 2x2	N-channel 30 V, 0.021 ohm typ., 6 A STripFET H6 power MOSFET in a PowerFLAT 2x2 package	ST	STL6N3LLH6

Item	Q.ty	Ref.	Part/value	Description	Manufacturer	Order code
24	1	Q201	RV3CA01ZPT2CL 3-XFDNFN 100 mW (Ta)	P-channel MOSFET	Rohm Semiconductor	RV3CA01ZPT2CL
25	1	R200	620 R 0201 1/20 W $\pm 1\%$ SMD	Resistor	Panasonic Electronics	ERJ-1GNF6200C
26	1	R201	100 K 0201 1/20 W $\pm 1\%$	Resistor	MULTICOMP	MCRE000188
27	1	R202	10 k 0201 1/20 W $\pm 1\%$	Resistor	VISHAY	CRCW020110K0FKED
28	1	R203	1.5 k 0201 1/20 W $\pm 1\%$	Resistor	MULTICOMP	MCRE000144
29	1	R204	0 R 0201 1/20 W	Resistor	Stackpole Electronics Inc	RMCF0201ZT0R00
30	1	R205	2.7 K 0201 1/20 W $\pm 5\%$	Resistor	Panasonic Electronics	ERJ-1GNJ272C
31	1	R206	1 K 0603 (1608 Metric) 0.1 W, 1/10 W $\pm 1\%$	Resistor	Yageo	RC0603FR-071KL
32	1	R207	20 K 0603 (1608 Metric) 0.1 W, 1/10 W $\pm 1\%$ SMD	Chip resistor	Panasonic Electronic	ERA-3AEB203V
33	1	R208	20 k 0201 1/20 W $\pm 1\%$	Resistor	Yageo	RC0201FR-0720KL
34	1	R209	27 K 0603 (1608 Metric) 0.1 W, 1/10 W $\pm 1\%$	Chip resistor	YAGEO	RC0603FR-0727KL
35	1	R210	56 K 0603 (1608 Metric) 0.1 W, 1/10 W $\pm 1\%$ SMD	Chip resistor	Vishay Dale	CRCW060356K0FKTA
36	1	R211	56 k 0201 1/20 W $\pm 1\%$	Resistor	Panasonic Electronics	ERJ-1GNF5602C
37	1	R300	200 k 0603 1/10 W $\pm 1\%$ SMD	Resistor	Vishay	CRCW0603200KFKEA
38	6	R301 R302 R303 R304 R305 R501	0 R 0603 1/10 W $\pm 1\%$	Resistors (not mounted)	Yageo	RC0603JR-070RL
39	5	R306 R307 R308 R309 R310	4.7 k 0201 1/20 W $\pm 1\%$ SMD	Resistors	Vishay	CRCW02014K70FNED
40	10	R400 R401 R402 R403 R404 R405 R406 R407 R408 R409	0 0603 (1608 Metric) 0.1 W, 1/10 W $\pm 1\%$ SMD	Chip resistors	Vishay	CRCW06030000Z0EB
41	2	R410 R411	1 M 0201 1/20 W $\pm 1\%$	Resistors	Yageo	RC0201FR-071ML
42	1	SB300	0 R 0603 1/10 W $\pm 1\%$	Jumper	Vishay	CRCW06030000Z0EB
43	3	SC1 SC2 SC3	Screw M2X4	Screws	RS	914-1462
44	1	SW1	Push-Bottom_WE4343 31013822 3.50mm x 2.90mm SPST-NO 0.05 A 12 V	Tactile switch	Würth Elektronik	434331013822

Item	Q.ty	Ref.	Part/value	Description	Manufacturer	Order code
45	1	SW400	Switch 6P - 25 mA 1P4T (1.4 mm height)	Slide switch	Diptronics	MSS14-V-T/R
46	2	SW401 SW402	Switch 4P 1P3T (1.4 mm height)	Slide switches	Mountain Switch	103-5041-EV
47	18	TP200 TP201 TP202 TP203 TP204 TP205 TP206 TP207 TP208 TP209 TP210 TP211 TP300 TP301 TP302 TP303 TP304 TP305	TPD	Test points	Any	Any
48	1	U200	STBC03JR chip scale package 0.4 mm pitch	Li-Ion linear battery charger with LDO and load switches	ST	STBC03JR
49	1	U201	TCPPO1-M12 QFN-12L	Overvoltage protection for USB Type-C or Power Delivery	ST	TCPPO1-M12
50	1	U300	LSF0108PWR 20-TSSOP (0.173", 4.40mm Width)	IC TRNSLTR BIDIRECTIONAL 20TSSOP	Texas Instruments	LSF0108PWR
51	1	U400	STG3692 VFQFPN 16 2.6x1.8x0.5	Low voltage high bandwidth quad SPDT	ST	STG3692QTR
52	1	PCB	FR4-IT180A-4Layer 43.3x23.84x1.38 mm	PCB	-	-

Table 5. STEVAL-ASTRA1NA bill of materials

Item	Q.ty	Ref.	Part/value	Description	Manufacturer	Order code
1	2	J1, J2 N.M.	Printed contacts	Printed contacts (not mounted)	-	-
2	1	J3 N.M.	Strip male 2X1 pitch 1.27	Jumper (not mounted)	-	-
3	2	P1, P2 N.M.	-	Passive components (not mounted)	-	-

Evaluation board license agreement

Important: *All information on this document is subject to this 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.

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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".

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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.

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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 it 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.

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