

Table 1: STEVAL-STRKT01 bill of materials

Item	Q.ty	Ref.	Part/Value	Description	Manufacturer	Order code
1	1	CN500		USB Type-C	Würth Electronics	632723300011
2	1	CN501	5-pin 5x1 2.54 mm pitch	Female header	Sullins Connector Solutions	PPPC051LFBN-RC
3	1	CN502	10-pin 10x1 2.54 mm pitch	Female header (not mounted)	Sullins Connector Solutions	PPPC101LFBN-RC
4	1	CN503	5-pin 2.54 mm pitch	Female header (not mounted)	Sullins Connector Solutions	PPPC051LFBN-RC
5	7	C102, C105, C115, C403, C503, C504, C505	1 μ F SMD 0402 6.3 V \pm 10%	Capacitors	Any	
6	7	C103, C113, C116, C310, C400, C404, C601	10 μ F SMD 0603 6.3 V \pm 20%	Capacitors	Any	
7	13	C104, C114, C117, C118, C203, C206, C301, C308, C309, C411, C412, C502, C602	100 nF SMD 0201 16 V \pm 10%	Capacitors	Any	
8	2	C108, C109	10 pF SMD 0201 25 V \pm 0.5 pF	Not mounted	Any	
9	2	C110, C112	0 Ohm SMD 0402	Capacitors	Any	
10	3	C200, C204, C208	120 pF SMD 0402 50 V \pm 5% COG, NP0	Capacitors	TDK	CGA2B2C0G1H121J050BA
11	3	C201, C202, C205	3.9 pF SMD 0402 6.3 V \pm 20%	Capacitors (not mounted)	Any	
12	1	C207	100 pF SMD 0201 16 V \pm 10%	Capacitor	Any	
13	1	C209	56 pF SMD 0201 16 V \pm 10%	Capacitor	Any	
14	1	C401	10 μ F SMD 0603 10 V \pm 10%	Capacitor	Any	
15	1	C402	4.7 μ F SMD 0402 6.3 V \pm 20%	Capacitor	Any	
16	1	C500	10 μ F SMD 0603 35 V \pm 20%	Capacitor	Murata	GRM188R6YA106MA73D
17	1	C501	47 μ F SMD 0805 10 V \pm 20%	Capacitor	Any	

Item	Q.ty	Ref.	Part/Value	Description	Manufacturer	Order code
18	1	C507	220 nF SMD 0603 50 V ±10%	Capacitor (not mounted)	Any	
19	1	D401	SMD 0402	Red LED	KingBright	KPHHS-1005SURCK
20	1	D402	ZENER_3V07 SOD323 0.02	Zener diode	Nexperia	BZX384-B3V0, 115
21	2	D403, D501	ESDALC6V1-1U2 0201 (0603 metric)	Single-line low capacitance Transil™ for ESD protection	ST	ESDALC6V1-1U2
22	1	D500	SMD 0402	White LED	VISHAY	VLMW1500-GS08
23	2	D503, D504	ESDALC5-1BF4 SMD 0201	Low clamping and low capacitance bidirectional single line ESD protection	ST	ESDALC5-1BF4
24	1	D505	ESDA7P60-1U1M 1610	High-power transient voltage suppressor (TVS)	ST	ESDA7P60-1U1M
25	2	D507, D508	ESDAULC5-1BF4 SMD 0201	Low clamping and ultra low capacitance bidirectional single line ESD protection	ST	ESDAULC5-1BF4
26	1	D509	ESDA7P120-1U1 QFN 1610	High-power transient voltage suppressor (TVS)	ST	ESDA7P120-1U1M
27	2	J100, J201	50 Ohm 6 Ghz SMD	Coaxial connector (not mounted)	Hirose	U.FL-R-SMT-1(10)
28	1	J101	Con_SMA	CONN SMA RCPT STR 50OHM EDGE MNT	Amphenol RF Division	132414
29	1	J200	RF in	RF ANT 1.56/1.575GHZ CER PATCH	Taoglas Ltd.	CGGBP.18.4.A.02
30	1	J500	CON3 SMT 3W 1.2 mm pitch	Connector	Molex	78171-0003
31	1	J501	SWD/JTAG NM THR 1.27 mm 2x5	Not mounted	Samtec	FTSH-105-01-F-D-K
32	1	J600	2-pin strip line, 2 poles, 2.54 mm pitch	Male header (not mounted)	Any	
33	2	L103, L104	L NM SMD 0402 ±0.1 nH	Not mounted	Any	
34	1	L200	6.8 nH SMD 0402 ±0.2 nH		Murata	LQW15AN6N8G00D
35	1	L201	100 nH SMD 0402 ±5 nH	Not mounted	Murata	LQG15HNR10J02

Item	Q.ty	Ref.	Part/Value	Description	Manufacturer	Order code
36	1	L202	27 nH SMD 0402 0.05		Murata Electronics North America	LQG15HS27NJ02D
37	1	L401	2.2 μ H SMD 1008 1.3 A 0.2		Würth Electronics/ TDK	74438323022 / VLS252010HBX-2R2M
38	1	L403	470 Ohms @ 100MHz SMD 0201		Murata	BLM03BD471SN1D
39	1	L406	1 Kohm 100 MHz SMD 0402 250 mA 0.25		Würth Electronics Inc / Murata	782422102/ BLM15HG102SN1D
40	2	Q500, Q501	STL4P3LLH6 PowerFlat (2x2)	P-Channel 30 V, 0.048 Ohm typ., 4 A STRipFET H6 Power MOSFET in PowerFLAT(TM) 2x2 package	ST	STL4P3LLH6
41	3	R100, R416, R418	100K SMD 0201 \pm 1%	Film resistors	Any	
42	12	R101, R125, R217, R501, R505, R506, R516, R517, R518, R519, R520, R603	10k SMD 0201 \pm 1%	Film resistors	Any	
43	2	R102, R103	4K7 SMD 0201 \pm 1%	Film resistors	Any	
44	28	R104, R105, R106, R109, R110, R113, R114, R117, R118, R121, R122, R126, R203, R205, R215, R219, R221, R319, R322, R323, R413, R414, R427, R428, R507, R513, R514, R606	0 NM SMD 0201 \pm 1%	Film resistors (not mounted)	Any	

Item	Q.ty	Ref.	Part/Value	Description	Manufacturer	Order code
45	35	R107, R108, R111, R112, R200, R204, R206, R210, R214, R216, R220, R226, R324, R325, R406, R409, R411, R412, R429, R430, R432, R433, R434, R435, R508, R510, R511, R512, R515, R521, R600, R601, R602, R604, R605	0 SMD 0201 ±1%	Film resistors	Any	
46	3	R116, R124, R410	1M SMD 0201 ±1%	Film resistors	Any	
47	1	R209	0 SMD 0402 ±1%	Film resistor	Any	
48	2	R213, R218	0 NM SMD 0402 ±1%	Film resistors (not mounted)	Any	
49	4	R222, R223, R224, R225	1K NM SMD 0201 ±1%	Film resistors (not mounted)	Any	
50	1	R401	590 SMD 0201 ±1%	Film resistor	Any	
51	1	R407	2K SMD 0201 ±1%	Film resistor	Any	
52	1	R408	20K SMD 0201 ±1%	Film resistor	Any	
53	2	R419, R421	10K NM SMD 0201 ±1%	Film resistors (not mounted)	Any	
54	1	R422	27K SMD 0201 ±1%	Film resistor	Any	
55	1	R423	56K SMD 0201 ±1%	Film resistor	Any	
56	1	R424	150 SMD 0201 ±1%	Film resistor	Any	
57	1	R425	33K SMD 0201 ±1%	Film resistor	Any	
58	1	R500	100 SMD 0201 ±1%	Film resistor	Any	
59	1	R504	21K SMD 0201 ±1%	Film resistor	Any	
60	1	R607	100k NM SMD 0201 ±1%	Film resistor (not mounted)	Any	
61	1	SW400	SMD4, 7x3, 5 mm	Switch	C&K Components	KMS233GLFG
62	1	SW500	FSM5M	Switch	TE Connectivity	1437566-3

Item	Q.ty	Ref.	Part/Value	Description	Manufacturer	Order code
63	42	TP100, TP101, TP104, TP105, TP106, TP107, TP108, TP109, TP110, TP111, TP112, TP115, TP200, TP201, TP202, TP205, TP206, TP322, TP324, TP326, TP327, TP404, TP405, TP406, TP407, TP408, TP409, TP410, TP411, TP412, TP413, TP415, TP416, TP417, TP418, TP419, TP420, TP421, TP502, TP503, TP504, TP505		Test points (not mounted)	Any	
64	1	U100	CMWX1ZZABZ-0 LoRA42X125X11	LoRa module	Murata	CMWX1ZZABZ-078
65	1	U101	STG3692 QFN16L (2.6mm x 1.8mm)	Low voltage quad SPDT switch	ST	STG3692QTR
66	1	U200	TESEO-LIV3F LCC 18 pin package (9.7x10.1)	Tiny GNSS module	ST	TESEO-LIV3F
67	1	U201	BGA725L6 TSLP-6-2	Low Noise Amplifier for GPS, GLONASS, Galileo and COMPASS	Infineon	BGA725L6
68	1	U202	B39162B4327P8 QCS5P 1.4 x1.1 x 0.4 mm	Automotive SAW RF filter for GPS, COMPASS and GLONASS	EPCOS	B39162B4327P810
69	1	U301	LIS2DW12 LGA-12	MEMS digital output motion sensor	ST	LIS2DW12
70	1	U303	HTS221 HLGA-6L (2 x 2 x 0.9 mm)	Humidity and temperature sensor	ST	HTS221TR
71	1	U304	LPS22HB HLGA-10L	MEMS nano pressure sensor	ST	LPS22HBTR
72	1	U400	STBC02 Flipchip30 (2.25 x 2.59 x 0.57 mm) 400um pitch	Li-Ion battery charger with LDO	ST	STBC02JR
73	1	U401	ST1PS01EJR Flip-chip8 1.11x1.41mm	400 mA synchronous step-down converter	ST	ST1PS01EJR

Item	Q.ty	Ref.	Part/Value	Description	Manufacturer	Order code
74	1	U500	STUSB1600 QFN24 EP 4x4 mm	USB Type-C controller	ST	STUSB1600AQTR
75	1	U600	M95M02-DR SO8	2-Mbit serial SPI bus EEPROM	ST	M95M02-DRMN6TP
76	1	Y100	NX2016SA 24 MHZ / EXS00A- CS05544 SMD	Crystal (not mounted)	NDK	NX2016SA 24MHZ / EXS00A-CS05544

**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 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.