

Bill of materials

Table 1. bill of materials

Item	Q.ty	Ref.	Value	Description	Manufacturer	Part number
1	4	C6, C8, CO4, CR4	100nF, C_0402, 50V, 10%,	Min 50V; X5R/X7R	Wurth	885012205092
2	2	C16, C17	N.M.		N.M.	N.M.
3	6	CO1, CO2, CO3, CR1, CR2, CR3	10uF, C_0805, 35V, 10%,	Min 35V; X5R/X7R	Murata	GRM21BR6YA106KE43 L
4	6	TP1, TP2, TP3, TP4, TP6, TP8	N.M., J_TESTPOINT_1.1mm,	PIN	N.M.	N.M.
5	5	R17, R18, R23, R24, R30	5k1, R_0402, 62.5m W, 5%,	Resistor	Yageo	RC0402JR-075K1L
6	4	C12, C21, C23, C25	100n, C_0402, 50V, 10%,	Min 6.3V; X5R/X7R	Wurth	885012205092
7	4	CS1, CS2, CS3, CS4	100nF, C_1206, 50V, 5%,	Min 50V; C0G	Murata	GRM31C5C1H104JA01 L
8	4	GND, GND1, VIN, VINV	HDR1X2,	Header 2	Harwin	M20-9730245
9	3	R4, R27, R28	10k, R_0402, 62.5m W, 5%,	Resistor	Yageo	RC0402JR-1310KL
10	7	R6, R7, R8, R14, R15, R16, R29	4k7, R_0402, 62.5m W, 5%,	Resistor	Yageo	RC0402JR-134K7L
11	2	C1, C3	10n, C_0402, 50V, 10%,	Min. 50V; X5R/X7R	Wurth	885012205067
12	2	C9, C10	47pF, C_0402, 50V, 5%,	Min. 6.3V; X5R/X7R	Wurth	885012005059
13	2	C13, C15	100pF, C_0402, 50V, 10%,	Min. 50V; X5R/X7R	Wurth	885012205055
14	1	C19	10uF, C_0603, 6.3V, 20%,	Min. 6.3V; X5R/X7R	Wurth	885012106006
15	4	C7, C20, C22, C24	4u7, C_0402, 6.3V, 20%,	Min. 6.3V; X5R/X7R	Wurth	885012105008
16	2	CBT1, CBT2	47nF, C_0402, 50V, 10%,	Min. 50V; X5R/X7R	Murata	GRT155R71H473KE01 D
17	2	D3, D6	D_0603_LED, 2V, 20mA,	RED	Wurth	150060RS75000
18	2	D7, D8	D_SMA (DO-214AC), 22V, 400W,	Diode	Littelfuse	SMAJ22A
19	2	P7, P8 connect coil 760308111 (item 27)	2mm_PIN,	COIL	N.M.	N.M.
20	2	R9, R31	33R, R_0402, 62.5m W, 5%,	Resistor	Yageo	RC0402FR-0733RL
21	2	R10, R13	1k, R_0402, 62.5m W, 5%,	Resistor	Yageo	RC0402JR-071KA

Item	Q.ty	Ref.	Value	Description	Manufacturer	Part number
22	2	R11, R19	1M, R_0402, 62.5m W, 5%,	Resistor	Yageo	RC0402JR-7D1ML
23	1	R12	1k, R_0603	Resistor	Yageo	RC0603JR-071KL
24	1	C2	22n, C_0402, 50V, 20%,	Min. 50V; X5R/X7R	Murata	GCM155R71H223MA55 D
25	1	C4	680p, C_0402, 50V, 10%,	Min. 50V; X5R/X7R	Wurth	885012205060
26	1	C5	1uF, C_0402, 10V, 20%,	Min. 16V; X5R/X7R	Wurth	885012105012
27	1	COIL connect to P7, P8 (item 19)			Wurth	760308111
28	1	D1	DIOMELF1006N	Diode	Diodes Incorporated	1N4448HLP-7
29	1	D2	N.M., D_SOD882	Diode	N.M.	N.M.
30	1	D4	D_0603_LED, 2V, 20mA	YELLOW	Wurth	150060YS55040
31	1	D5	D_0603_LED, 2V, 20mA	GREEN	Wurth	150060VS55040
32	1	F1	F_SMD_1206_DIN3216M 65V, 3A	Fuse	Bourns	SF-1206S300W-2
33	1	J1	J_PTH_POWERJACK_2.1M M, 18V, 1.5A	Barrel connector	Kubiconn	163-179PH-EX
34	1	J2	USB_C_UJC-HP-3-SMT-TR, 3A	USB_C_6pin	CUI devices	UJC-HP-3-SMT-TR
35	1	L1	L_SMD_0805_DIN2012M, 3A	Inductor	Wurth	742792025
36	1	NTC	N.M., HDR1X2	Header 2	N.M.	N.M.
37	1	P1	HDR2X3	Header 3X2	Harwin	M20-9720345
38	1	P2	HDR2X4	Header 4X2	Harwin	M20-9720445
39	1	P3	N.M., 2mm_PIN	PIN	N.M.	N.M.
40	1	J3	J_USB4105-GF-A-120, 20V, 5A	USB Type-C® connector 16-pin	Wurth	629722000214
41	1	P6 solder together	P_solderingoption_02	Solder bridge, keep close	N.M.	N.M.
42	1	P10 keep open	P_solderingoption_02	Solder bridge, keep open	N.M.	N.M.
43	1	P14	HDR1X16	Header 16	Harwin	M20-9991645
44	1	R1	5k1, R_0402, 62.5m W, 1%	Resistor 1%	Yageo	RC0402FR-075K1L
45	1	R2	10k, R_0402, 62.5m W, 1%	Resistor 1%	Yageo	RC0402FR-0710KL
46	1	R3	220k, R_0402, 62.5m W, 1%	Resistor 1%	Yageo	RC0402FR-07220KL
47	1	R5	100R, R_0402, 62.5m W, 5%	Resistor	Yageo	AR0402JR-07100RL
48	1	R20	560k, R_0402, 62.5m W, 1%	Resistor 1%	Yageo	RC0402FR-07560KL
49	1	R21	47k, R_0402, 62.5m W, 1%	Resistor 1%	Yageo	RC0402FR-0747KL
50	2	R25, R26	N.M., R_0402, 5%	Resistor	N.M.	N.M.
51	1	S1	SWITCH_P-DT2112C	SW-SPST	DIPTRONIC	P-DT2112C
52	1	TP5	N.M., J_TESTPOINT_1.1mm	PIN	N.M.	N.M.
53	1	TP7	N.M., P_SMD_TEST_12	Test Point	N.M.	N.M.

Item	Q.ty	Ref.	Value	Description	Manufacturer	Part number
54	1	U2	B_72B_240um	STWBC86_Bump 72	STMicroelectronic s	STWBC86
55	1	U3	U_WQFN28	FT260Q	FTDI	FT260Q-T
56	1	U4	V_SOT23-6L	USBLC6-2SC6, SOT23-6L	STMicroelectronic s	USBLC6-2SC6
57	4		Jumpers short SDA, SCL, INT, and POWER coming from USB Type- C® (in the center of 2x3 header)	Short SDA, SCL, INT, and POWER coming from USB Type-C® (in the center of 2x3 header)	Würth	60900213421
58	1		Both sides tape. Total length 32m, means 220 PCBs (dimension 12.7x13mm) , 1mm thickness		3M	5958FR(1/2"X36YD)
59	6		Standoff Material requirement UL94 - V0 or V1	Standoff, hex metric, M3	Würth	970080365
60	4		Untreated standoff Material requirement UL94 - V0 or V1	Standoff, M3, untreated	Würth	960060042
61	4		Screw with flat head M3 Material requirement UL94 - V0 or V1	Screw M3 with flat head	Essentra	50M030050I016
62	2		Screw M3 Material requirement UL94 - V0 or V1	Screw M3	Würth	97790603111
63	1		Custom spacer STEVAL- WBC86TX rev A Material requirement UL94 - V0 or V1		Vendor for plexi	Vendor for plexi

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.

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.

IMPORTANT NOTICE – READ CAREFULLY

STMicroelectronics NV and its subsidiaries (“ST”) reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST’s terms and conditions of sale in place at the time of order acknowledgment.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of purchasers’ products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. For additional information about ST trademarks, refer to www.st.com/trademarks. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2023 STMicroelectronics – All rights reserved