

Bill of materials
Table 1. STDES-50W2CWBC bill of materials

Item	Q.ty	Ref.	Part/value	Description	Manufacturer	Order code
1	9	C207 C215 C217-218 C223-224 C226 C236-237	100 nF, 0402, 25 V, ±10 %, X7R, SMD	Capacitors	Kemet or generic	C0402C104K3RACTU
2	8	C214 C216 C225 C227 C314-315 C418 C425	10 nF, 0402, 50 V, ±10 %, X7R, SMD	Capacitors	Kemet or generic	C0402C103K5RACTU
3	6	C208 C240 C310 C313 C402 C423	1 nF, 0402, 50 V, ±5 %, C0G, SMD	Capacitors	Kemet or generic	C0402C102J5GACTU
4	2	C220 C230	1 nF, 0402, 100 V, ±10 %, X7R	Capacitors	Kemet or generic	GRM155R72A102KA01D
5	1	C238	1 µF, 0402, 6.3 V, ±10 %, X7R	Capacitor	Kemet or generic	C0402C105K3RACTU
6	2	C228-229	33 PF, 0402, 50 V, ±5 %, C0G, SMD	Capacitors	Kemet or generic	C0402C330J5GACTU
7	2	C201 C235	4.7 µF, 0402, 6.3 V, ±20 %, X5R, SMD	Capacitors	Murata or generic	GRM155R60J475ME47
8	1	C202	470 nF, 0402, 35 V, ±10 %, X5R, SMD	Capacitor	Kemet or generic	C1005X5R1V474M050BC
9	2	C221-222	8.2 PF, 0402, 50 V, ±5 %, C0G, SMD	Capacitors	Kemet or generic	C0402C829J5GACTU
10	10	C101-102 C304-307 C419-422	10 µF, 1210, 50 V, ±10 %, X7S, SMD	Capacitors	Murata	GCM32EC71H106KA03L
11	4	C407-408 C410 C412	100 nF, 1812, 100 V, ±5 %, G0G, SMD	Capacitors	TDK	C4532C0G2A104J320KA
12	2	C409 C415	47 nF, 1812, 100 V, ±5 %, G0G, SMD	Capacitors	TDK	C4532C0G2A473J200KA
13	12	C100 C203 C210 C241-243 C302 C309 C400 C431-433	100 nF, 0603, 50 V, ±10 %, X7R, SMD	Capacitors	Kemet or generic	C0603C104K5RACTU
14	1	C204	10 µF, 0603, 16 V, ±20 %, X7R, SMD	Capacitor	Murata or generic	GRM188R61C106MA73
15	1	C206	10 µF, 0603, 35 V, ±20 %, X5R, SMD	Capacitor	Murata or generic	GRM188R6YA106ME15D
16	3	C211-213	330 nF, 0603, 50 V, ±10 %, X7R, SMD	Capacitors	TDK or generic	C1608X7R1H334K080AC
17	2	C209 C231	5.6 nF, 0603, 100 V, ±10 %, X7R, SMD	Capacitors	Kemet or generic	C0603C562K5RACTU

Item	Q.ty	Ref.	Part/value	Description	Manufacturer	Order code
18	1	R300 R408	0.010R, 1 W, 2512, 1 W, ± 0.1 %, SMD	Resistors	Vishay Precision Group Foil Resistors	Y14870R01000B9R
19	12	R106-108 R220-221 R224 R301-302 R400 R403-404 R407	0 R, 0402, 1/16 W, ± 5 %, SMD	Resistors	Yageo or generic	RC0402JR-070RL
20	1	R200	0R1, 0402, 1/16 W, ± 5 %, SMD	Resistor	Yageo or generic	RL0402JR-070R1L
21	1	R231	1.2 K, 0402, 1/16 W, ± 0.1 %, SMD	Resistor	Yageo or generic	RE0402BRE071K2L
22	12	R202 R204 R208-209 R229 R303-304 R411-415	10 K, 0402, 1/16 W, ± 5 %, SMD	Resistors	Yageo or generic	RC0402JR-0710KL
23	7	R101-102 R201 R219 R305-307	10 R, 0402, 1/16 W, ± 5 %, SMD	Resistors	Yageo or generic	RC0402JR-0710RL
24	1	R410	100 K, 0402, 1/16 W, ± 5 %, SMD	Resistor	Yageo or generic	RC0402JR-07100KL
25	4	R416 R421 R423 R425	10K, 0402, 1/16 W, ± 5 %, SMD	Resistors	Yageo or generic	RC0402JR-0710KL
26	2	R203 R210	150 K, 0402, 1/16 W, ± 5 %, SMD	Resistors	Yageo or generic	RC0402JR-07150KL
27	3	R212 R225-226	2.2 R, 0402, 1/16 W, ± 5 %, SMD	Resistors	Yageo or generic	RC0402JR-072R2L
28	2	R218 R222	3.3 K, 0402, 1/16 W, ± 1 %, SMD	Resistors	Yageo or generic	RC0402FR-073K3L
29	2	R230 R234	330 K, 0402, 1/16 W, ± 0.1 %, SMD	Resistors	Yageo or generic	RE0402BRE07330KL
30	3	R227-228 R237	4.7 K, 0402, 1/16 W, ± 5 %, SMD	Resistors	Yageo or generic	RC0402JR-074K7L
31	1	R233	5.6K, 0402, 1/16 W, ± 0.1 %, SMD	Resistors	Yageo or generic	RE0402BRE075K6L
32	2	R207 R223	47 K, 0402, 1/16 W, ± 1 %, SMD	Resistors	Yageo or generic	RC0402FR-0747KL
33	2	R213 R217	470 K, 0402, 1/16 W, ± 5 %, SMD	RESISTOR SMD 470 K_5%_0402_1/16W	Yageo or generic	RC0402JR-07470KL
34	2	R422 R428	47 K, 0402, 1/16 W, ± 5 %, SMD	Resistors	Yageo or generic	RC0402JR-0747KL
35	1	R232	9.1K, 0402, 1/16 W, ± 0.1 %, SMD	Resistors	Yageo or generic	RE0402BRE079K1L
36	2	R206 R211	47 K, 0402	NTC resistors	Murata	NCP15WB473F03RC
37	1	L200	10 μ H, L2.5_W2.0_H1.2, 1.3 A, DCR max 0.540 ohm	ISAT	TDK	VLS252012HBX-100M-1
38	1	L400	1 μ H, IND_L6.8_W6.8, 4.6 A, RDC = 14 mohm max.	ISAT	Würth Elektronik	744062001
39	1	L300	3.3 μ H, L9.2_W8.5, 8.25 A, ± 20 %, 0.0149 ohm	Power inductor	Würth Elektronik	74437358033

Item	Q.ty	Ref.	Part/value	Description	Manufacturer	Order code
40	2	Q411-412	BC856B, SOT323, 80 V	PNP	ONSEMI	BC856BMTF
41	3	Q405 Q410 Q413	NPN, SOT323, 50 V, 100 m A, 205 mW RB = RC = 10 K	Transistors	NXP	PDTC114EU,135
42	1	Q100	N-MOS, SOT23, 30 V, 0.56 A	Small signal MOSFET	ONSEMI	NTR4003NT1G
43	1	D400	10 V, SOD323, 0.2 W	Voltage regulator	NXP or generic	BZX384-C10,115
44	1	Q404	P-MOS, POWERDI3333-8, 30 V, 11.5 A	P-MOS	Diodes Incorporated	DMP3017SFGQ-7
45	2	D401-402	1N4148WS-7-F, SOD323, 75 V, 150 m A	General purpose diodes	Diodes Incorporated	1N4148WS-7-F
46	2	Q201-202	N-MOS, SOT23	Enhancement mode field effect N-MOS	ONSEMI	2N7002
47	2	Q200 Q203	N-MOS, SOT723-3, 20 V, 0.89 A	Small signal MOSFETs	ONSEMI	NTK3134NT1G
48	1	Y200	16MHZ-10PPM-8PF, L2.0_W1.6	SMD crystal	NDK	NX2016SA 16MHZ EXS00A-CS06655
49	1	J100	632723300011, CON_USB_C_632723300011	USB TYPE C_632723300011	Würth Elektronik	632723300011
50	1	J101	FTSH-107-01-L-DV-K-A, CON_FTSH-107-01-L-DV-K-A	SMD_HEADER_2x7_P1.27	Samtec	FTSH-107-01-L-DV-K-A
51	1	J201	4PIN, 1X4, 2.54 mm	Connector	Any	-
52	1	D100	ESDA25P35-1U1M, QFN-2L	High-power transient voltage suppressor	ST	ESDA25P35-1U1M
53	1	D102	ECMF02-2AMX6, QFN-6L	Common-mode filter and ESD protection for USB 2.0 and MIPI/MDDI interfaces	ST	ECMF02-2AMX6
54	1	D103	ESDALC6V1M3, SOT883	Dual low capacitance Transil array for ESD protection	ST	ESDALC6V1M3
55	1	D104	BAT30KFILM, SOD-523	30 V, 300 mA SMD general purpose signal Schottky diode	ST	BAT30KFILM
56	5	D204-208	BAT54KFILM, SOD-523	40 V, 300 mA general purpose signal Schottky diodes	ST	BAT54KFILM
57	2	D200-201	RB541VM-40, SOD-323, 40 V, 200 m A,	SMT Schottky diodes	Rohm	RB541VM-40TE-17
58	10	Q300-301 Q400-403 Q406-409	STL20N6F7, PowerFLAT 3.3x3.3	N-channel 60 V, 0.0046 Ohm typ., 20 A STripFET F7 Power MOSFETs in a PowerFLAT 3.3x3.3 package	ST	STL20N6F7
59	1	U203	LMV321ILT, SOT23-5L	Low power rail-to-rail input/output op-amp	ST	LMV321ILT
60	2	U201-202	STG719STR, SOT23-6L	Low voltage 4 ohm SPDT switch	ST	STG719STR
61	1	U200	STWBC2-HP, VFQFPN 8X8X1.0 68L PITCH 0.4 ROU T A	Digital controller for wireless battery charger transmitters	ST	STWBC2-HP
62	2	D203 D209	0603	Green LEDs	Würth Elektronik	150060VS75000
63	1	D202	0603	Red LEDs	Würth Elektronik	150060RS75000
64	2	R235-236	100 R, 0402, 1/16 W, ±5 %, SMD	Resistors	Yageo or generic	RC0402JR-07100RL
65	1	C308	47 µF, D6.3	Aluminum electrolytic capacitor	Panasonic	EEEFTH470XAP

Item	Q.ty	Ref.	Part/value	Description	Manufacturer	Order code
66	1	C104	33 nF, 0603, 50 V, $\pm 10\%$, X7R, SMD	Capacitor	Kemet or generic	C0603C333K5RACTU

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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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 – PLEASE READ CAREFULLY

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