

## Bill of materials

Table 1. STEVAL-LLL014V1 bill of materials

Item	Q.ty	Ref.	Part / Value	Description	Manufacturer	Order code
1	1	-	Table 2. STEVAL-LLL014M1	Control board	ST	Not available for separate sale
2	1	-	Table 3. STEVAL-LLL014D1	LED board	ST	Not available for separate sale

Table 2. STEVAL-LLL014M1 bill of materials

Item	Q.ty	Ref.	Part / Value	Description	Manufacturer	Order code
1	17	C1, C3, C8, C10, C11, C12, C13, C16, C17, C18, C34, C35, C36, C37, C39, C41, C42	100n 16V	Ceramic Capacitor	Murata	GCJ188R71C104KA01#
2	2	C2, C38	10n 25V	Ceramic Capacitor	Murata	GCJ188R71E103KA01#
3	1	C4	10u 10V	Ceramic Capacitor	Murata	GRT188D71A106ME73#
4	4	C5, C25, C29, C50	1u 16V	Ceramic Capacitor	Murata	GCM188R71C105KA64#
5	2	C6, C7	47p	Ceramic Capacitor	Murata	GCM1885C2A470GA16#
6	1	C9	4.7u 16V	Ceramic Capacitor	Murata	GRT188C71C475KE13#
7	2	C14, C15	18p	Ceramic Capacitor	Murata	GCM1885C2A180GA16#
8	5	C19, C21, C43, C44, C45	4.7u 100V	Ceramic Capacitor	Murata	GCJ32DC72A475KE01#
9	1	C20	22n 25V	Ceramic Capacitor	Murata	GCJ188R71E223KA01#
10	1	C22	100p	Ceramic Capacitor	Murata	GCM1885C2A101GA16#
11	1	C24	1u 16V	Ceramic Capacitor	Murata	GCJ21BR71C105KA01#
12	4	C26, C27, C28, C31	10u 50V	Ceramic Capacitor	Murata	GCM31CD71H106KE36#
13	1	C30	1u 100V	Ceramic Capacitor	Murata	GCJ21BC72A105KE02#
14	1	C32	EEH2C1K470P	Polarized Capacitor	Panasonic	EEH2C1K470P
15	1	C33	1u 50V	Ceramic Capacitor	Murata	GCJ21BR71H105KA01#
16	1	C40	470n 16V	Ceramic Capacitor	Murata	GCJ188R71C474KA12#
17	1	C46	63SXV100M	Polarized Capacitor	Panasonic	63SXV100M
18	3	C47, C48, C49	100n 100V	Ceramic Capacitor	Murata	GCJ188R72A104KA01#
19	1	D1	STPS1H100AY, SMA	Power Diode	ST	STPS1H100AY
20	1	D2	STPS2L60AY, SMA	Power Diode	ST	STPS2L60AY
21	1	D3	KP-2012LSGC	LED SMD GREEN	Kingbright	KP-2012LSGC
22	1	D4	KPT-2012SURCK	LED SMD RED	Kingbright	KPT-2012SURCK

Item	Q.ty	Ref.	Part / Value	Description	Manufacturer	Order code
23	1	J1	USB_B_Mini	USB Mini Connector	Wuerth	65100516121
24	1	J2	Phoenix 1715022	Power Connector	Phoenix	1725656
25	1	J3	PANEL_OUT	LED Connector	Wuerth	613010143121
26	1	J4	UDE-STK	JTAG Connector	Wuerth	61201421621
27	1	J5	MCU_7709	2x07 Stripline 2.54 pitch	Wuerth	61301421121
28	1	L1	XGL1010-153	Power Inductor	Coilcraft	XGL1010-153
29	1	L2	MPZ2012S221A	Ferrite Bead	TDK	MPZ2012S221A
30	1	L3	78279224401	Ferrite Bead	Wuerth	78279224401
31	1	L4	XGL6060-472	Ferrite Bead	Coilcraft	XGL6060-472
32	4	L5, L6, L7, L8	PFD2015-472ME	EMI Filter	Coilcraft	PFD2015-472ME
33	1	Q1	SQJ481EP	Power PMOS	Vishay	SQJ481EP-T1_GE3
34	1	Q2	STL8N10LF3, PowerFLAT 5x6 WF	Power NMOS	ST	STL8N10LF3
35	2	R1, R2	3K	SMD Resistor	Panasonic	ERJPA3F3001V
36	2	R3, R21	10K	SMD Resistor	Panasonic	ERJPA3F1002V
37	2	R4, R5	27R	SMD Resistor	Panasonic	ERJPA3F27R0V
38	1	R6	39K	SMD Resistor	Panasonic	ERJPA3F3902V
39	1	R7	11K	SMD Resistor	Panasonic	ERJPA3F1102V
40	1	R8	61.8K	SMD Resistor	Panasonic	ERJPA3F6192V
41	1	R9	120K	SMD Resistor	Panasonic	ERJPA3F1203V
42	1	R10	0.039 2W	2W SMD Resistor	TE Connectivity	TLRP3A20CR039FTE
43	1	R11	62K	SMD Resistor	Panasonic	ERJUP3F6202V
44	1	R12	6K8		Panasonic	ERJPA3F6801V
45	1	R13	4K7	SMD Resistor	Panasonic	ERJPA3F4701V
46	1	R14	56K	SMD Resistor	Panasonic	ERJPA3F5602V
47	1	R15	68K	SMD Resistor	Panasonic	ERJPA3F6802V
48	1	R16	2K4	SMD Resistor	Panasonic	ERJPA3F2401V
49	1	R17	2K2	SMD Resistor	Panasonic	ERJPA3F2201V
50	1	R18	1K8	SMD Resistor	Panasonic	ERJUP3F1801V
51	1	R19	100R	SMD Resistor	Panasonic	ERJPA3F1000V
52	1	R22	3R3	SMD Resistor	Panasonic	ERJH3QF3R30V
53	1	R23	1K1	SMD Resistor	Panasonic	ERJPA3F1101V
54	1	R24	1K5	SMD Resistor	Panasonic	ERJUP3F1501V
55	3	SW1, SW2, SW3	PTS645xx43SMT R92	Tactile Switch	C&K	PTS645SM43SMTR92LFS
56	1	U1	LD1117S33TR, SO-8	3.3V LDO	ST	LD1117S33TR
57	1	U2	USBLC6-2P6, SOT666	USB Filter	ST	USBLC6-2P6

Item	Q.ty	Ref.	Part / Value	Description	Manufacturer	Order code
58	1	U3	SPC582B60E1MH00Y, TQFP 64 10x10x1.0	Automotive 32bit MCU	ST	SPC582B60E1MH00Y
59	1	U4	FT230XQ-R	USB-UART bridge	FTDI	FT230XQ-R
60	1	U5	ALED7709ATR, QFPN 5X5X0.90 24L PITCH 0.65	Automotive LED driver	ST	ALED7709ATR
61	1	Y1	40MHz 18pF	40MHZ Crystal	Citizen	HC-49/U-S40000000ABJB

**Table 3. STEVAL-LLL014D1 bill of materials**

Item	Q.ty	Reference	Part/Value	Description	Manufacturer	Order code
1	40	D9, D10, D11, D12, D13, D14, D15, D16, D17, D18, D19, D20, D21, D22, D23, D24, D25, D26, D27, D28, D29, D30, D31, D32, D33, D34, D35, D36, D37, D38, D39, D40, D41, D42, D43, D44, D45, D46, D47, D48	KW DPLS34.KD	Automotive SMD LED	OSRAM	KW DPLS34.KD
2	1	J1	Conn_01x10	LED Connector	Wuerth	61301011021
3	1	J2	SHORT_TEST	Jumper	TE CONN	5-146276-2
4	4	J3, J4, J5, J6	OPEN_TEST	Jumper	TE CONN	5-146276-2
5	1	RV1	NCG18XH103F0SRB	NTC Resistor	Murata	NCG18XH103F0SRB

## 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

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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.

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