
Getting started with the STEVAL boards based on the LED1202 LED driver

Introduction

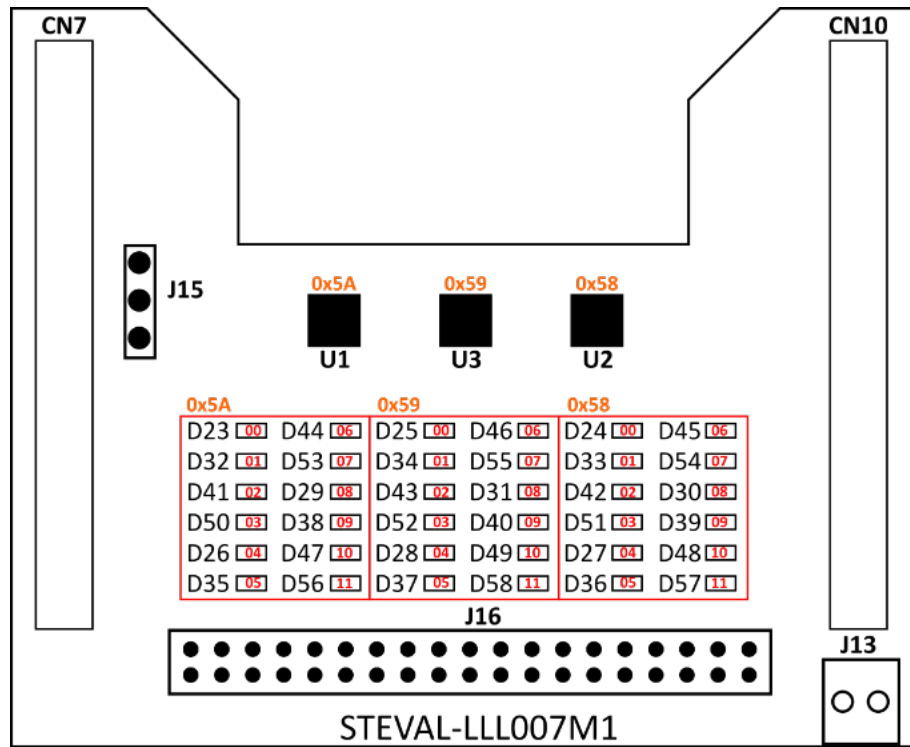
There are four types of evaluation boards that mount a different number of LED1202 LED drivers. Each board has different LEDs devices with different kind of layout panels, to demonstrate the versatility of the LED1202 when configured with different types of LED, monochrome, or RGB.

All the boards share the same software application, the [STSW-LED1202GUI](#). In this way the use of any of these STEVAL is not different from any other.

1 STEVAL-LLL007V1

The STEVAL-LLL007V1 is an eval-kit, composed by a main board, the STEVAL-LLL007M1, that houses three LED1202 together with a 6x6 White LEDs panel, and two daughter boards (the STEVAL-LLL007D1 and STEVAL-LLL007D2), that can be connected with the main board through the connector J16. The White LEDs panel can be supplied by the Nucleo-64 internal supply or by an 5V external supply through the J13 connector. The figure below shows how the three LED1202 are connected with the White LEDs panel. It also reports the I2C address for each IC and which LED channel is associated with each White LED.

Figure 1. STEVAL-LLL007V1 main board



The STEVAL-LLL007V1 works when connected with a Nucleo-64 board, programmed with the STSW-LLL007FW firmware.

To help you evaluate all the features of the LED1202 driver, you can connect the main board to a NUCLEO-L073RZ development platform running the STSW-LLL007FW firmware, which comes with preconfigured random and wave patterns for use in standalone mode.

You can even develop your own pattern sequences by connecting the Nucleo platform to a PC running a dedicated GUI program, which also gives you access to all the LED driver settings.

To achieve the maximum luminosity, you need to supply the STEVAL-LLL007D1 panel board and the STEVAL-LLL007D2 panel board with an external power source via the J13 connector on the STEVAL-LLL007M1 board.

2 STEVAL-LLL011V1

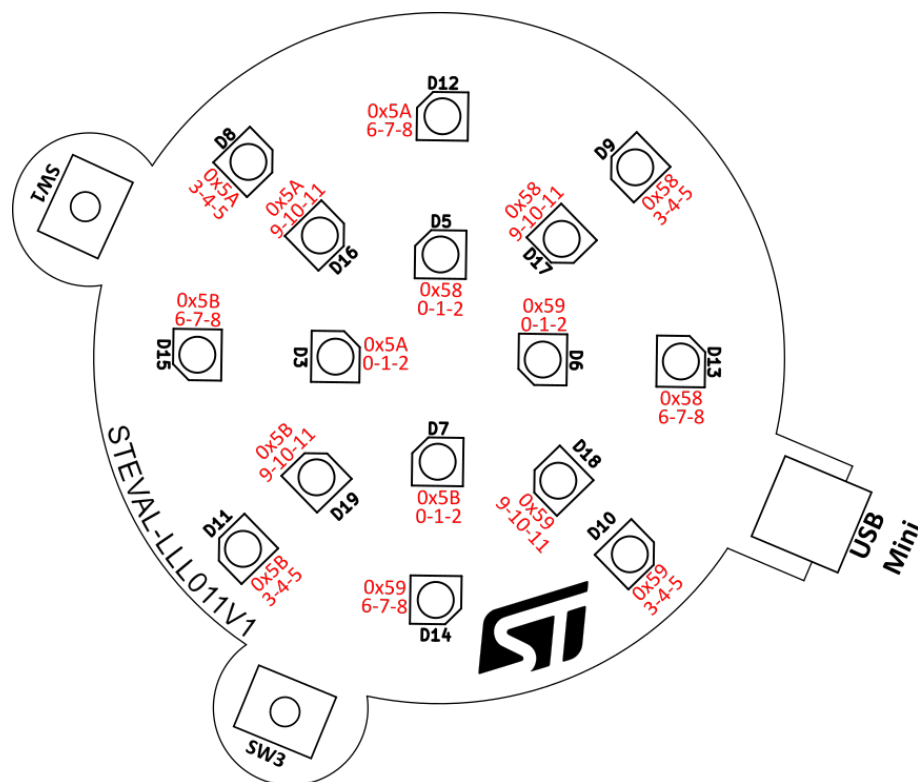
The STEVAL-LLL011V1 is a standalone evaluation kit, composed by four LED1202 ICs connected with 16 RGB LEDs as showed in the layout below. For each LED, is reported the I2C address and the channels at which is connected.

The LED1202 is connected with an STM32L073 MCU. The MCU communicates with the PC software with a USB cable.

Two switches, SW1 and SW3, are present on top of the board, and can be programmed by the user to drive light effects. On the rear of the board are present two switches:

- SW4 switches on the board. Once the board is on, it can be switched off by pressing and holding SW4.
- SW2 launches the script loaded on the MCU. At each SW2 press, the next script is launched.

Figure 2. STEVAL-LLL011V1 board

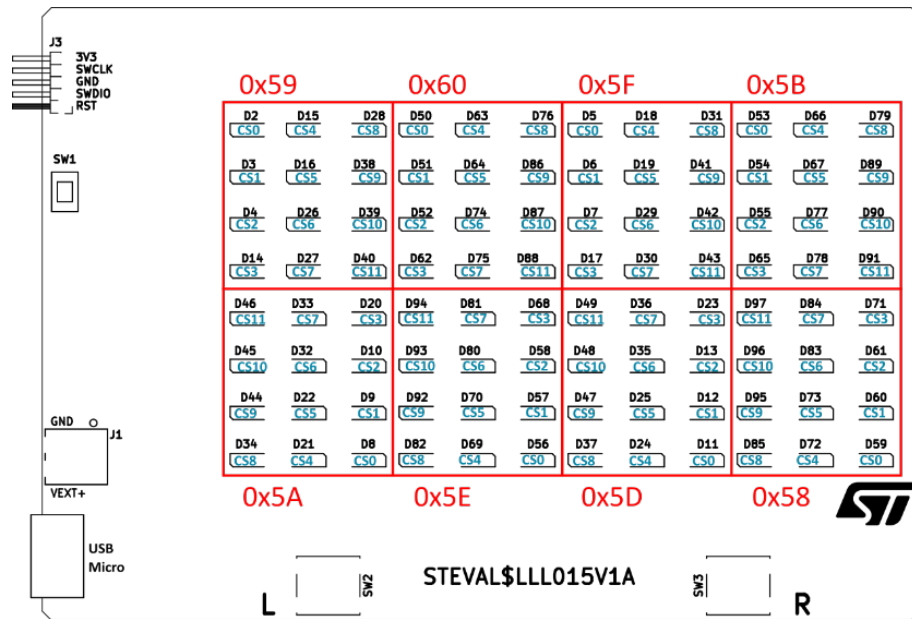


The board includes gyroscope and microphone sensors that can be programmed via USB to trigger LED effects. It is designed for portable applications with a Li-ion battery, which is charged via USB thanks to the embedded linear battery charger. Alternative external power supply is also supported.

3 STEVAL-LLL015V1

The STEVAL-LLL015V1 is an evaluation board with eight LED1202 and an STM32L072 MCU. In this board 8 LED1202 are connected to a single I2C bus and synchronized with the same clock. The STM32L072 acts as a bridge between the LED drivers and the PC software: communication is performed by a USB cable that supplies the board too. Alternatively, the board can be supplied by the connector J1. The figure below shows a panel of 96 white LEDs grid, divided into eight rectangles. Each rectangle reports the I2C address of the LED1202 driver and the channel connected to each LED. The SW1 is used to launch the scripts inside of the MCU. SW1 and SW3, can be programmed by the user to drive light effects.

Figure 3. STEVAL-LLL015V1 board



4 X-NUCLEO-LED12A1

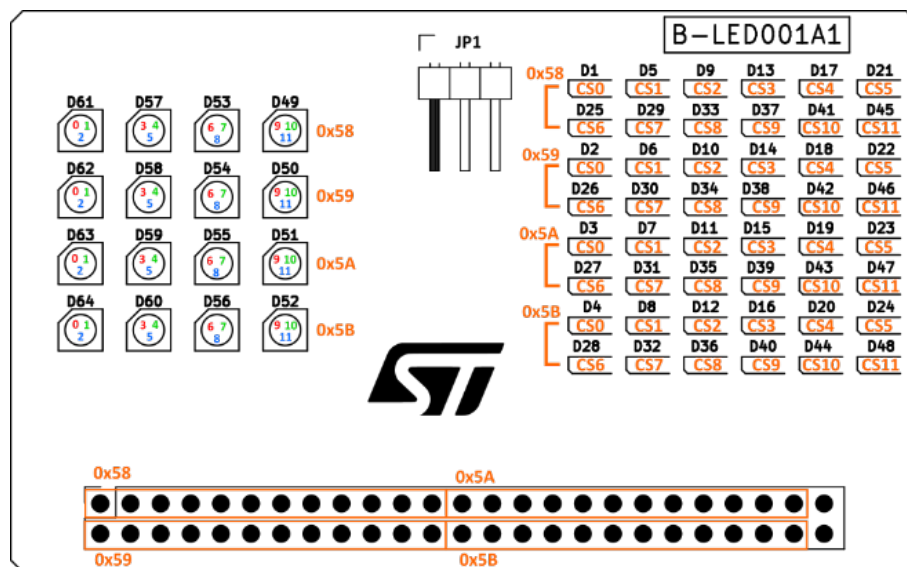
The LED1202 is a 12-channel low quiescent current LED driver, which guarantees 5 V output driving capability. Each channel is able to provide up to 20 mA with a headroom voltage of 350 mV (typ.) only.

The output current can be adjusted separately for each channel through an 8-bit analog and 12-bit digital dimming control.

The X-NUCLEO-LED12A1 expansion board comes with an additional LED panel board that houses two LEDs matrices: a 6x8 white LED matrix and a 4x4 RGB matrix.

LED matrices can be supplied via an external power supply connected to the J13 connector and by selecting the right path through the J15 jumper to reach the maximum luminosity available.

Figure 4. X-NUCLEO-LED12A1



The panel is divided into two subpanels:

- A 6x8 White LEDs subpanel
- A 4x4 RGB LEDs subpanel

Only one subpanel at a time can be used, by acting on the connector JP1.

For each subpanel, are reported the I2C address of the LED1202 driver and how each LED is connected to any LED1202 channel.

5 STEVAL-LLL007M1 schematic diagrams

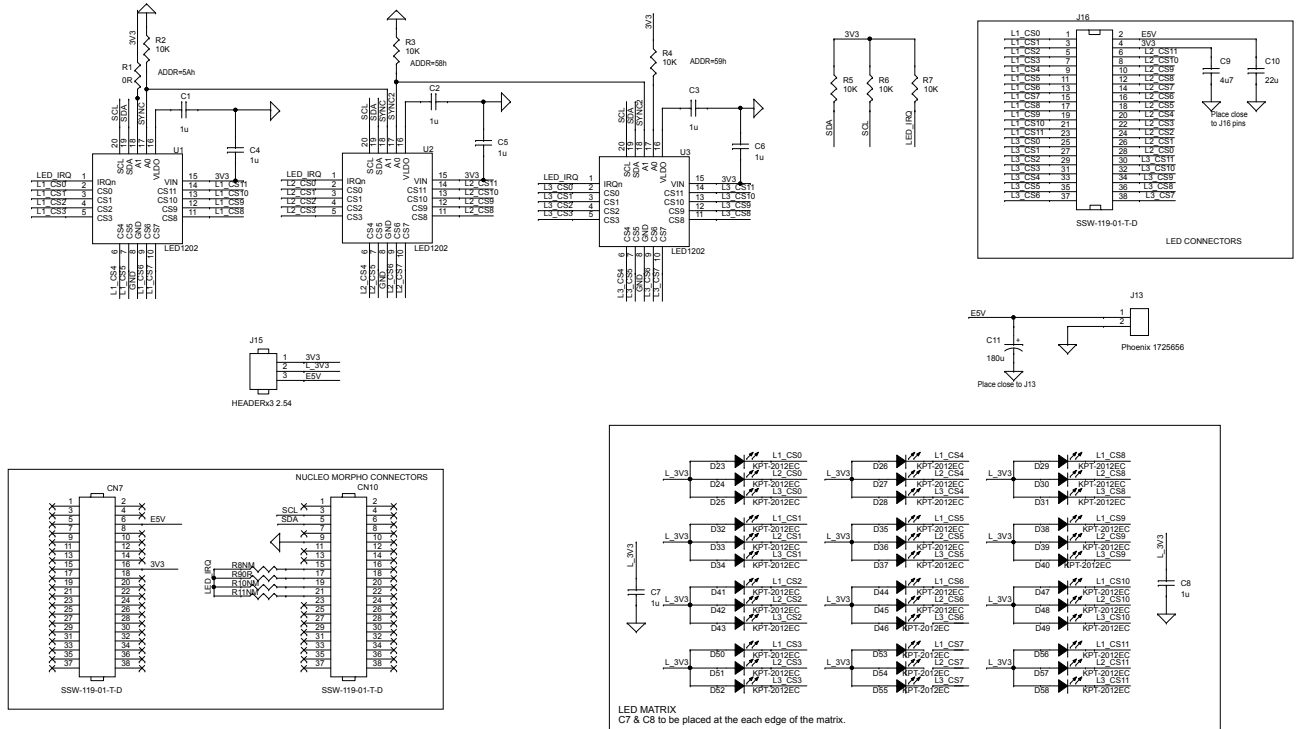
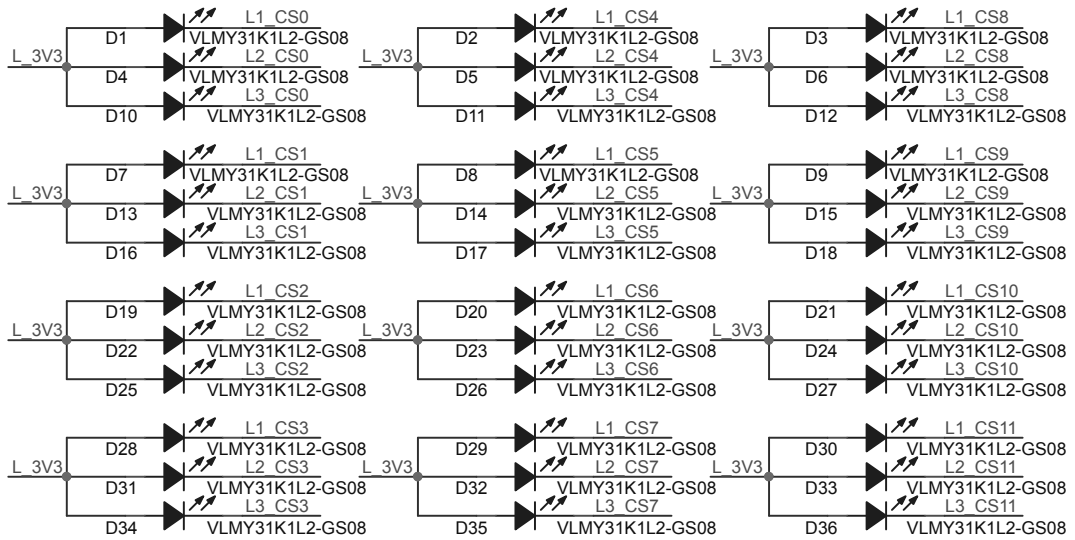
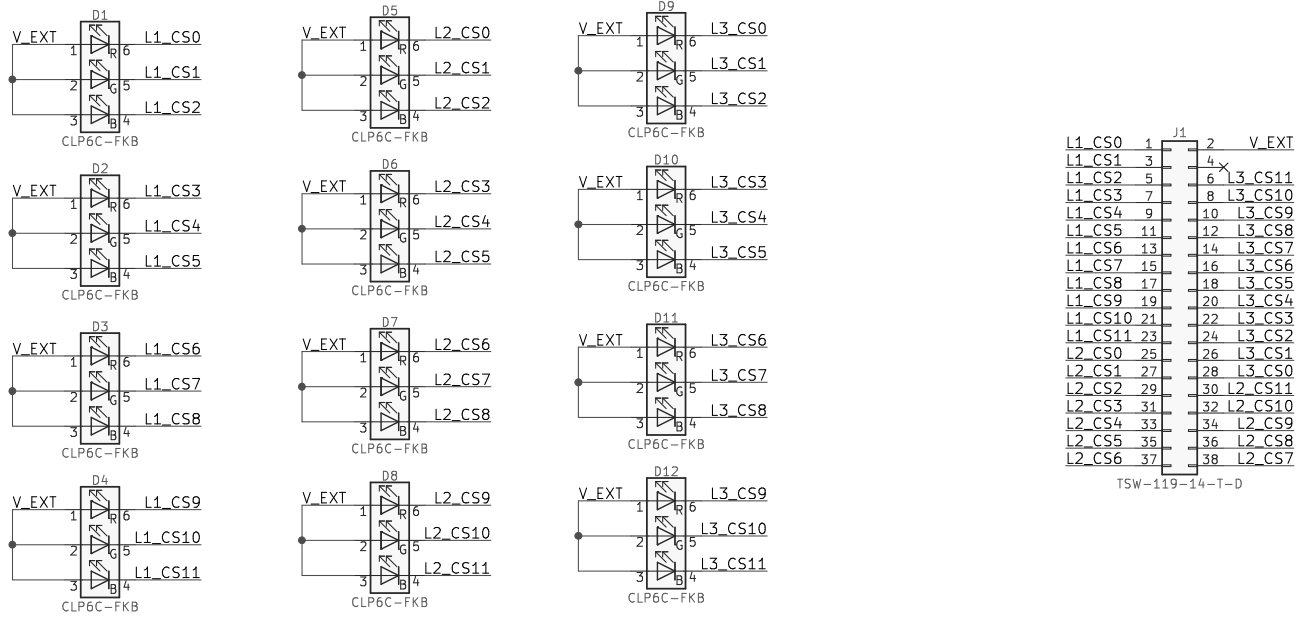
Figure 5. STEVAL-LLL007M1 circuit schematic


Figure 6. STEVAL-LLL007D1 circuit schematic


J1

L1 CS0	1	2	L 3V3
L1 CS1	3	4	L3 CS11
L1 CS2	5	6	L3 CS10
L1 CS3	7	8	L3 CS9
L1 CS4	9	10	L3 CS8
L1 CS5	11	12	L3 CS7
L1 CS6	13	14	L3 CS6
L1 CS7	15	16	L3 CS5
L1 CS8	17	18	L3 CS4
L1 CS9	19	20	L3 CS3
L1 CS10	21	22	L3 CS2
L1 CS11	23	24	L3 CS1
L2 CS0	25	26	L3 CS0
L2 CS1	27	28	L2 CS11
L2 CS2	29	30	L2 CS10
L2 CS3	31	32	L2 CS9
L2 CS4	33	34	L2 CS8
L2 CS5	35	36	L2 CS7
L2 CS6	37	38	

header 2 rows - pitch 2.54

Figure 7. STEVAL-LLL007D2 circuit schematic


6 STEVAL-LLL007M1 bill of materials

Table 1. STEVAL-LLL007M1 bill of materials

Item	Q.ty	Ref.	Part/Value	Description	Manufacturer	Order code
1	3	CN7, CN10, J16	SSW-119-01-T-D	Connector	Samtec	SSW-119-01-T-D
2	6	C1, C2, C3, C4, C5, C6	1 μ , 16V \pm 10%	Capacitor SMD 0603	TDK	CGA3E1X7R1C105K080AC
3	2	C7, C8	1 μ , 16V \pm 10%	Capacitor SMD 1206	Murata	GRM31MR71C105KA01L
4	1	C9	4.7 μ , 16V \pm 10%	Capacitor SMD 1210	Murata	GRM32RR71C475KA01L
5	1	C10	22 μ , 16V \pm 10%	Capacitor SMD 1210	Murata	GRM32ER61C226KE20L
6	1	C11	180 μ , 16V \pm 10%	Capacitor, C6-6.3mm	Panasonic	16SVPF180M
7	36	D23 - D58	LED	white	ROHM	SMLMN2WB1CW1C
8	1	J13	Phoenix 1725656	Jumper	Phoenix	1725656
9	1	J15	HEADERx3 2.54	Jumper	Multicomp	2211S-03G
10	3	R2, R4, R6, R14	10K \pm 1%	Resistor, SMD 0603	ANY	ANY
11	3	R7, R8, R9	10K \pm 1%	Resistor, SMD 0604	ANY	ANY
12	1	R11	0R \pm 1%	Resistor, SMD 0605	ANY	ANY
13	3	R10, R12, R13	NM	Resistor, SMD 0606	ANY	ANY
14	3	U1, U2, U3	12 channel	LED driver	ST	LED1202

Table 2. STEVAL-LLL007D1 bill of materials

Item	Q.ty	Ref.	Part/Value	Description	Manufacturer	Order code
1	36	D1 - D36	LED	White	OSRAM	LW TVSG.BB-AZBZ-FBKC-1
2	1	J1	pitch 2.54	header 2 rows	SAMTEK	TSW-119-07-F-D

Table 3. STEVAL-LLL007D2 bill of materials

Item	Q.ty	Ref.	Part/Value	Description	Manufacturer	Order code
1	12	D1 - D12	LED	RGB	CREE	CLP6C-FKB
2	1	J1	pitch 2.54	header 2 rows	SAMTEK	TSW-119-07-F-D

7 STEVAL-LLL007V1 kit versions

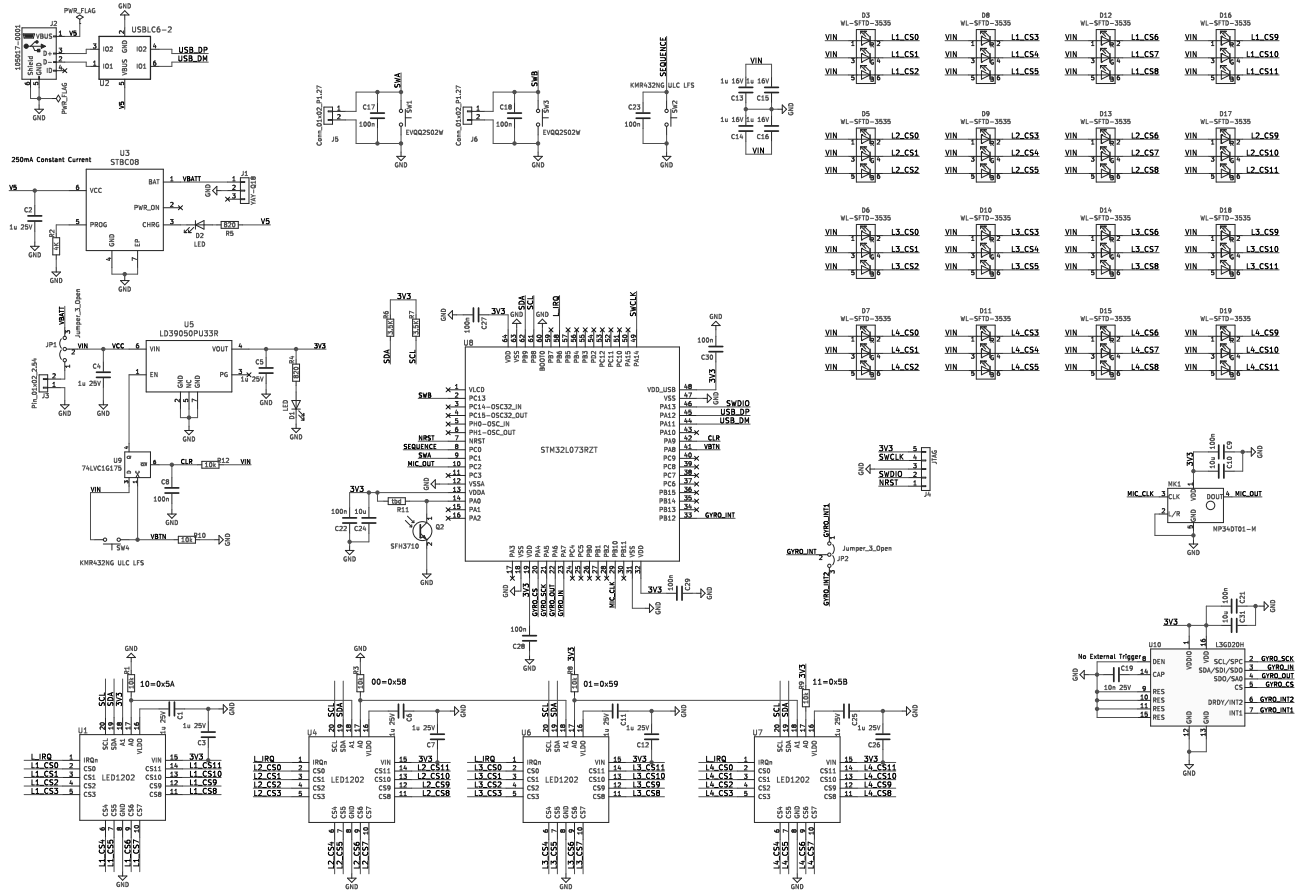
Table 4. STEVAL-LLL015V1 kit versions

PCB version	Schematic diagrams	Bill of materials
STEVAL\$LLL007V1A ⁽¹⁾	STEVAL\$LLL007V1A schematic diagrams	STEVAL\$LLL007V1A bill of materials

1. This code identifies the STEVAL-LLL007V1 evaluation kit first version. The kit consists of a STEVAL-LLL007M1 whose version is identified by the code STEVAL\$LLL007M1A, a STEVAL-LLL007D1 whose version is identified by the code STEVAL\$LLL007D1A and a STEVAL-LLL007D2 whose version is identified by the code STEVAL\$LLL007D2A.

8 STEVAL-LLL011V1 schematic diagrams

Figure 8. STEVAL-LLL011V1 schematic



9 STEVAL-LLL011V1 bill of materials

Table 5. STEVAL-LLL011V1 bill of materials

Item	Q.ty	Ref.	Part / Value	Description	Manufacturer	Order code
1	11	C1, C3, C6, C7, C11, C12, C25, C26, C2, C4, C5	1 μ 25V	C 0603 1608Metric	Würth	885012206076
2	4	C13, C15, C14, C16	1 μ 16V	C 1206 3216Metric	Würth	885012208036
3	1	C19	10n 25V	C 0603 1608Metric	Würth	885012206065
4	11	C23, C22, C28, C29, C27, C30, C8, C9, C18, C17, C21	100n	C 0603 1608Metric	Würth	885012206071
5	3	C24, C10, C31	10 μ	C 0603 1608Metric	Würth	885012106006
6	2	D1, D2	LED	LED 0603 1608Metric	Würth	150060GS73220
7	16	D3, D8, D12, D16, D5, D9, D13, D17, D6, D10, D14, D18, D7, D11, D15, D19	WL-SFTD-3535	WL-SFTD-3535	Würth	150353M153300
8	1	J1 (not mounted)	YAY-Q18	mill-max-821-22-003-10-000101	-	-
9	1	J2	105017-0001	USB Micro-B Molex-105017-0001	Molex	105017-0001
10	1	J3	Pin_01x02_2.54	PinHeader 1x02 P2.54mm Horizontal	Würth	61300211121
11	1	J4	JTAG	PinHeader 1x05 P1.27mm Horizontal	-	-
12	2	J5, J6 (not mounted)	Conn_01x02_P1.27	PinHeader 1x02 P1.27mm Horizontal	-	-
13	2	JP1, JP2	Jumper_3_Open	SolderJumper-3 P2.0mm Open TrianglePad1.0x1.5 mm	-	-
14	1	MK1	-	MEMS audio sensor omnidirectional digital microphone	ST	MP34DT01-M
15	1	Q2 (not mounted)	-	Silicon NPN Phototransistor	OSRAM	SFH3710
16	6	R1, R3, R8, R9, R10, R12	10k	R 0603 1608Metric	-	-
17	1	R2	4K	R 0603 1608Metric	-	-
18	2	R4, R5	820	R 0603 1608Metric	-	-
19	2	R6, R7	3.5K	R 0603 1608Metric	-	-
20	1	R11	10K	R 0603 1608Metric	-	-
21	2	SW2, SW4	-	KMR432NGULCLFS	C&K	KMR432NG ULC LFS
22	2	SW3, SW1	-	SW SPST EVQQ2	Panasonic	EVQQ2S02W

Item	Q.ty	Ref.	Part / Value	Description	Manufacturer	Order code
23	4	U1, U4, U6, U7	-	VFQFPN20 3x3 0.5	ST	LED1202
24	1	U2	-	SOT-666	ST	USBLC6-2
25	1	U3	-	DFN-6-1EP 3x3mm Pitch0.95mm	ST	STBC08
26	1	U5	-	DFN-6-1EP 3x3mm Pitch0.95mm	ST	LD39050PU33R
27	1	U8	-	LQFP-64 10x10mm Pitch0.5mm	ST	STM32L073RZT
28	1	U9	-	SOT-363 SC-70-6	TI	74LVC1G175
29	1	U10	-	LGA-16 3x3mm P0.5mm L3GD20H	ST	L3GD20H

10 STEVAL-LLL011V1 board versions

Table 6. STEVAL-LLL011V1 versions

PCB version	Schematic diagrams	Bill of materials
STEVAL\$LLL011V1A ⁽¹⁾	STEVAL\$LLL011V1A schematic diagrams	STEVAL\$LLL011V1A bill of materials

1. This code identifies the STEVAL-LLL011V1 evaluation board first version. It is printed on the board PCB.

11 STEVAL-LLL015M1 schematic diagrams

Figure 9. STEVAL-LLL015M1 schematic diagram (1 of 3)

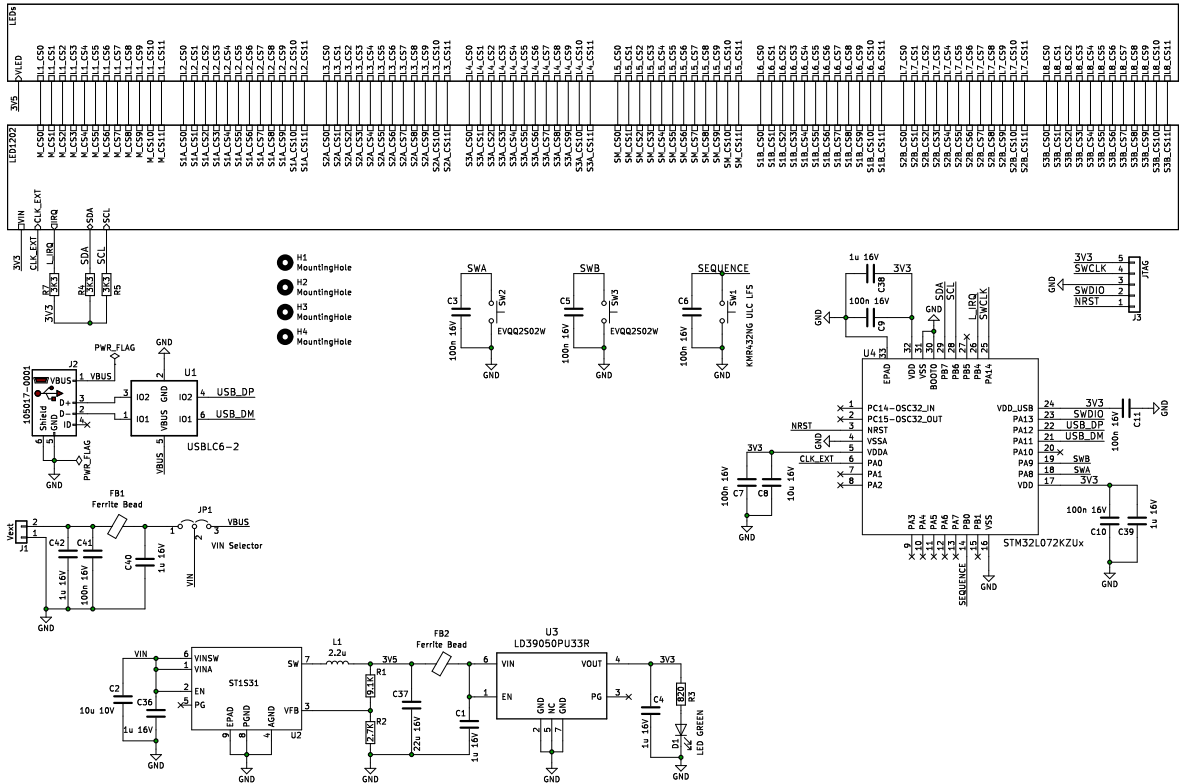


Figure 10. STEVAL-LLL015D1 schematic diagram (2 of 3)

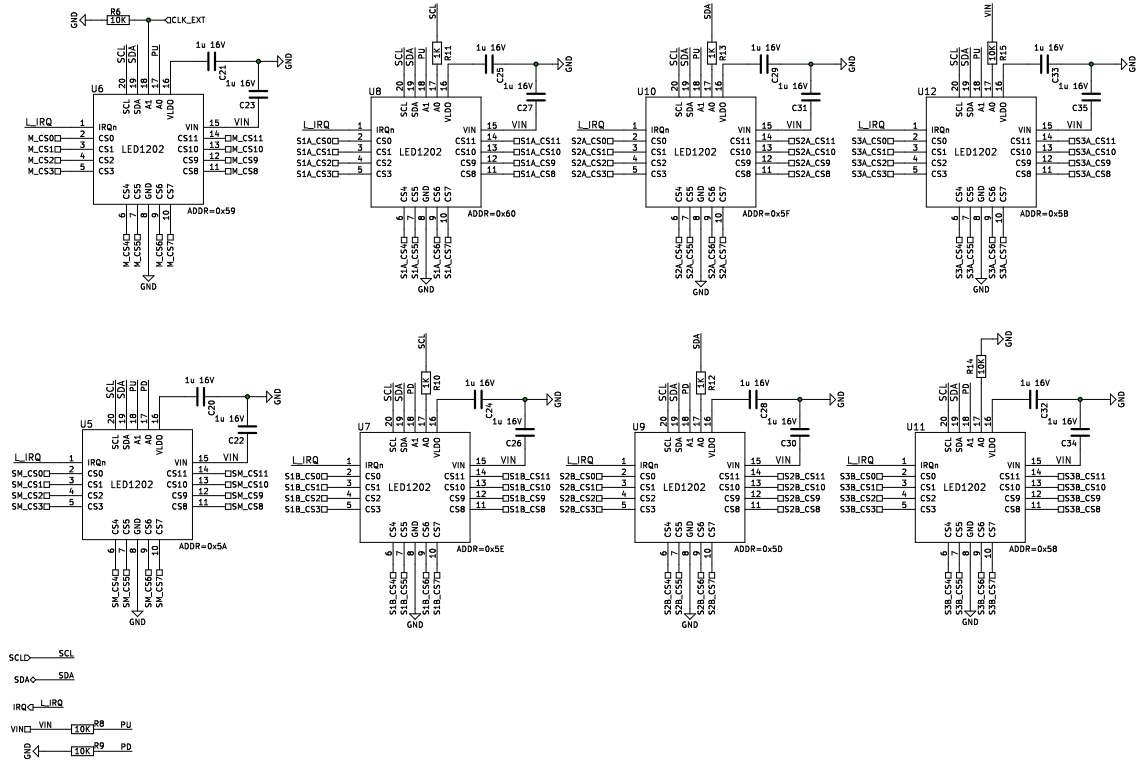
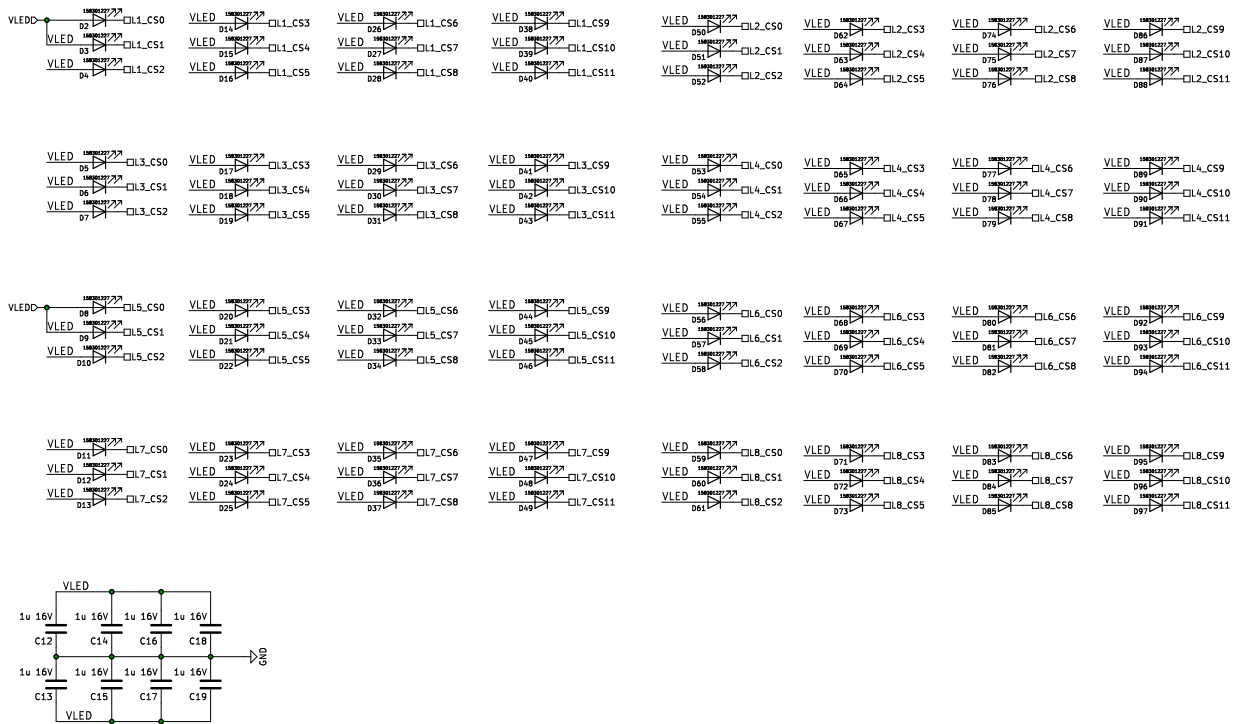


Figure 11. STEVAL-LLL015D1 schematic diagram (3 of 3)


12 STEVAL-LLL015V1 bill of materials

Table 7. STEVAL-LLL015V1 bill of materials

Item	Q.ty	Ref.	Part / Value	Description	Manufacturer	Order code
1	3	C1, C4, C36	1u 16V	Ceramic Capacitor	Murata	GCM21BL81C105KA58L
2	1	C2	10u 10V	Ceramic Capacitor	Wuerth	885012108010
3	8	C3, C5, C6, C7, C9, C10, C11, C41	100n 16V	Ceramic Capacitor	Wuerth	885012206046
4	1	C8	10u 16V	Ceramic Capacitor	Wuerth	885012108017
5	8	C12, C13, C14, C15, C16, C17, C18, C19	1u 16V	Ceramic Capacitor	Murata	GCJ31CL8EL105KA07L
6	20	C20, C21, C22, C23, C24, C25, C26, C27, C28, C29, C30, C31, C32, C33, C34, C35, C38, C39, C40, C42	1u 16V	Ceramic Capacitor	Wuerth	885012206052
7	1	C37	22u 16V	Ceramic Capacitor	Wuerth	885012108018
8	1	D1	LED GREEN	LED SMD	Wuerth	150060GS73220
9	96	D2, D3, D4, D5, D6, D7, D8, 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, D49, D50, D51, D52, D53, D54, D55, D56, D57, D58, D59, D60, D61, D62, D63, D64, D65, D66, D67, D68, D69, D70, D71, D72, D73, D74, D75, D76, D77, D78, D79, D80, D81, D82, D83, D84, D85, D86, D87, D88, D89, D90, D91, D92, D93, D94, D95, D96, D97	158301227	LED SMD	Wuerth	158301227
10	1	FB1	Ferrite Bead	Ferrite Bead	TDK	MPZ2012S221A
11	1	FB2	Ferrite Bead	Ferrite Bead	TDK	MPZ2012S331A

Item	Q.ty	Ref.	Part / Value	Description	Manufacturer	Order code
12	4	H1, H2, H3, H4	MountingHole	Mechanical Hole	NA	NA
13	1	J1	Vext	Power Connector	Phoenix	1725656
14	1	J2	105017-0001	USB Micro Connector	Molex	105017-0001
15	1	J3	JTAG	PCB Connector	Multicom	MC-HRT1-S05-G
16	1	JP1	VIN Selector		NA	NA
17	1	L1	2.2u	Power Inductor	Wuerth	74438356022
18	1	R1	9.1K	SMD Resistor	Panasonic	ERJ-UP3F9101V
19	1	R2	2.7K	SMD Resistor	Panasonic	ERJ-UP3F2701V
20	1	R3	820	SMD Resistor	Panasonic	ERJ3EKF8200V
21	3	R4, R5, R7	3K3	SMD Resistor	Panasonic	ERJ3EKF3301V
22	5	R6, R8, R9, R14, R15	10K	SMD Resistor	Panasonic	ERJ3EKF1002V
23	4	R10, R11, R12, R13	1K	SMD Resistor	Panasonic	ERJ-UP3F1001V
24	1	SW1	Tactile Switch	Tactile Switch	C&K Components	KMR432NG ULC LFS
25	2	SW2, SW3	Tactile Switch	Tactile Switch	Panasonic	EVQQ2S02W
26	1	U1	USBLC6-2, SOT666	EMI USB Filter	ST	USBLC6-2P6
27	1	U2	ST1S31, VFDFPN 8 3x3x1.0	DC/DC Converter	ST	ST1S31PUR
28	1	U3	LD39050PU33R, DFN6 3x3	3.3V LDO	ST	LD39050PU33R
29	1	U4	STM32L072KZ Ux, UFQFPN 32 5x5x0.55 mm	32 bit ARM MCU	ST	STM32L072KZU6
30	8	U5, U6, U7, U8, U9, U10, U11, U12	LED1202, WFQFPN 3X3X0.60 20L PITCH 0.5	LED Driver	ST	LED1202QTR

13 STEVAL-LLL015V1 board versions

Table 8. STEVAL-LLL015V1 versions

PCB version	Schematic diagrams	Bill of materials
STEVAL\$LLL015V1A ⁽¹⁾	STEVAL\$LLL015V1A schematic diagrams	STEVAL\$LLL015V1A bill of materials

1. This code identifies the STEVAL-LLL015V1 evaluation board first version. It is printed on the board PCB.

14 STEVAL-LLL015V1 regulatory compliance information

Notice for US Federal Communication Commission (FCC)

For evaluation only; not FCC approved for resale

FCC NOTICE - 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 this chapter, 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 3.1.2.

Notice for Innovation, Science and Economic Development Canada (ISED)

For evaluation purposes only. This kit generates, uses, and can radiate radio frequency energy and has not been tested for compliance with the limits of computing devices pursuant to Industry Canada (IC) rules.

À des fins d'évaluation uniquement. Ce kit génère, utilise et peut émettre de l'énergie radiofréquence et n'a pas été testé pour sa conformité aux limites des appareils informatiques conformément aux règles d'Industrie Canada (IC).

Notice for the European Union

This device is in conformity with the essential requirements of the Directive 2014/30/EU (EMC) and of the Directive 2015/863/EU (RoHS).

Notice for the United Kingdom

This device is in compliance with the UK Electromagnetic Compatibility Regulations 2016 (UK S.I. 2016 No. 1091) and with the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 (UK S.I. 2012 No. 3032).

16 X-NUCLEO-LED12A1 bill of materials

Table 9. X-NUCLEO-LED12A1 expansion board bill of materials

Item	Q.ty	Ref.	Part/Value	Description	Manufacturer	Order code
1	1	CN5 Female on Top, Male on Bottom	CONN1x10 2.54 mm	Connector	Würth	61301011121
2	2	CN6, CN9 Female on Top, Male on Bottom	CONN1x8 2.54 mm	Connectors	Würth	61300811121
3	2	CN7, CN10	CONN19x2 2.54, low insertion force	Connectors (not mounted)	Any	Any
4	1	CN8 Female on Top, Male on Bottom	CONN1x6 2.54 mm	Connector	Würth	61300611121
5	10	C1, C2, C3, C4, C5, C6, C12, C13, C14, C15	1 µF, 16 V, C0603	Capacitors	Any	Any
6	1	C10	22 µF, 16 V, CAPC-1210	Capacitor	Any	Any
7	1	C11	180u 16V, CEVSMD_6V3X8_T,	Capacitor	Any	Any
8	1	J13	WR-TBL Series 2109 2.54 mm, horizontal entry, MORS_2P_2V54_P	Header	Würth	691210910002
9	1	J15	HEADERx3 2.54 mm	Header	Würth	61300311121
10	1	J18	CONN PLUG 25x2 2.54 mm, right angle	Header	Amphenol	T821150A1R100CEU
11	2	R1, R11	0 R, R0603	Resistors	Any	Any
12	8	R2, R3, R4, R5, R6, R7, R12, R14	10K, R0603	Resistors	Any	Any
13	1	R13	36 K, R0603	Resistor	Any	Any
14	4	R15, R16, R17, R18	0 R, R0603	Resistors (not mounted)	Any	Any
15	4	U1, U2, U3, U4	LED1202, VFQFPN20_3X3	12-channel low quiescent current LED driver	ST	LED1202QTR
16	1	U5	LDL112PT-TR, PPAK	1.2 A low quiescent current LDO with reverse current protection	ST	LDL112PT-TR

Table 10. LED panel bill of materials

Item	Q.ty	Ref.	Value	Description	Manufacturer	Part Number
1	48	D1, D2, D3, D4, D5, D6, D7, D8, 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	PLCC	White LEDs	Würth	158301227
2	16	D49, D50, D51, D52, D53, D54, D55, D56, D57, D58, D59, D60, D61, D62, D63, D64	150353M153300, WL-SFTD-3535	RGB LEDs	Würth	150353M153300
3	1	J1	PinSocket_2x25_P2.54mm_Vertical_SMD	LED connector	Multicomp	2214S-50SG-85
4	1	JP1	PinHeader_1x03_P2.54mm_Horizontal	Panel selector	Würth	61300311021

17 X-NUCLEO-LED12A1 board versions

Table 11. X-NUCLEO-LED12A1 versions

PCB version	Schematic diagrams	Bill of materials
X\$NUCLEO-LED12A1 ⁽¹⁾	X\$NUCLEO-LED12A1 schematic diagrams	X\$NUCLEO-LED12A1 bill of materials

1. This code identifies the X-NUCLEO-LED12A1 evaluation board first version. It is printed on the board PCB.

Revision history

Table 12. Document revision history

Date	Revision	Changes
24-Oct-2024	1	Initial release.

Contents

1	STEVAL-LLL007V1	2
2	STEVAL-LLL011V1	3
3	STEVAL-LLL015V1	4
4	X-NUCLEO-LED12A1	5
5	STEVAL-LLL007M1 schematic diagrams	6
6	STEVAL-LLL007M1 bill of materials	9
7	STEVAL-LLL007V1 kit versions	10
8	STEVAL-LLL011V1 schematic diagrams	11
9	STEVAL-LLL011V1 bill of materials	12
10	STEVAL-LLL011V1 board versions	14
11	STEVAL-LLL015M1 schematic diagrams	15
12	STEVAL-LLL015V1 bill of materials	18
13	STEVAL-LLL015V1 board versions	20
14	STEVAL-LLL015V1 regulatory compliance information	21
15	X-NUCLEO-LED12A1 schematic diagrams	22
16	X-NUCLEO-LED12A1 bill of materials	23
17	X-NUCLEO-LED12A1 board versions	25
	Revision history	26
	List of tables	28
	List of figures	29

List of tables

Table 1.	STEVAL-LLL007M1 bill of materials	9
Table 2.	STEVAL-LLL007D1 bill of materials	9
Table 3.	STEVAL-LLL007D2 bill of materials	9
Table 4.	STEVAL-LLL015V1 kit versions	10
Table 5.	STEVAL-LLL011V1 bill of materials	12
Table 6.	STEVAL-LLL011V1 versions	14
Table 7.	STEVAL-LLL015V1 bill of materials	18
Table 8.	STEVAL-LLL015V1 versions	20
Table 9.	X-NUCLEO-LED12A1 expansion board bill of materials	23
Table 10.	LED panel bill of materials.	24
Table 11.	X-NUCLEO-LED12A1 versions	25
Table 12.	Document revision history	26

List of figures

Figure 1.	STEVAL-LLL007V1 main board	2
Figure 2.	STEVAL-LLL011V1 board	3
Figure 3.	STEVAL-LLL015V1 board	4
Figure 4.	X-NUCLEO-LED12A1	5
Figure 5.	STEVAL-LLL007M1 circuit schematic	6
Figure 6.	STEVAL-LLL007D1 circuit schematic.	7
Figure 7.	STEVAL-LLL007D2 circuit schematic.	8
Figure 8.	STEVAL-LLL011V1 schematic	11
Figure 9.	STEVAL-LLL015M1 schematic diagram (1 of 3)	15
Figure 10.	STEVAL-LLL015D1 schematic diagram (2 of 3)	16
Figure 11.	STEVAL-LLL015D1 schematic diagram (3 of 3)	17
Figure 12.	X-NUCLEO-LED12A1 expansion board circuit schematic.	22
Figure 13.	LED panel circuit schematic	22

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.

© 2024 STMicroelectronics – All rights reserved