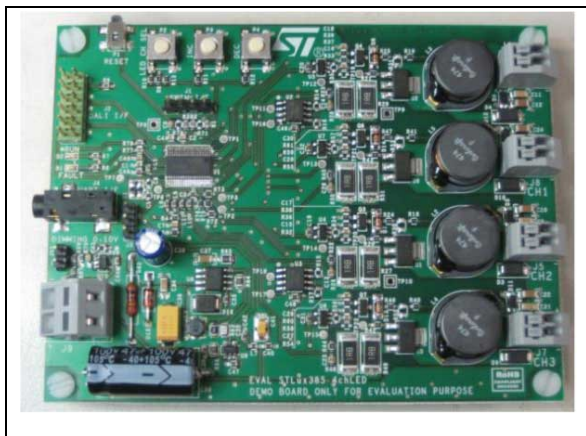


200 W, digital 4-LED channels demonstration board with STLUX385A-controlled current regulation and dimming

Data brief



regulates the LED current, exploiting the fixed-off-time (FOT) principle. Each channel can output current in the range of 250 mA to 1 A.

The number of LEDs, the current and the PWM dimming working point can be set through the command interpreter, accessible via the serial interface. Dimming can also be manually adjusted via the three on-board buttons.

The demonstration board can be optionally controlled via a DALI interface. The DALI connection board is available separately (part number STEVAL-ILM001V1). The STLUX385A DALI software drivers and application firmware are available.

Features

- Based on the STLUX385A digital controller
- Up to 200 W
- 4 LED channels
- Adjustable LED current and dimming
- Adaptive voltage compensation
- Real-time fault detection and protection (e.g: short or open circuit)
- Serial interface
- DALI (optional)

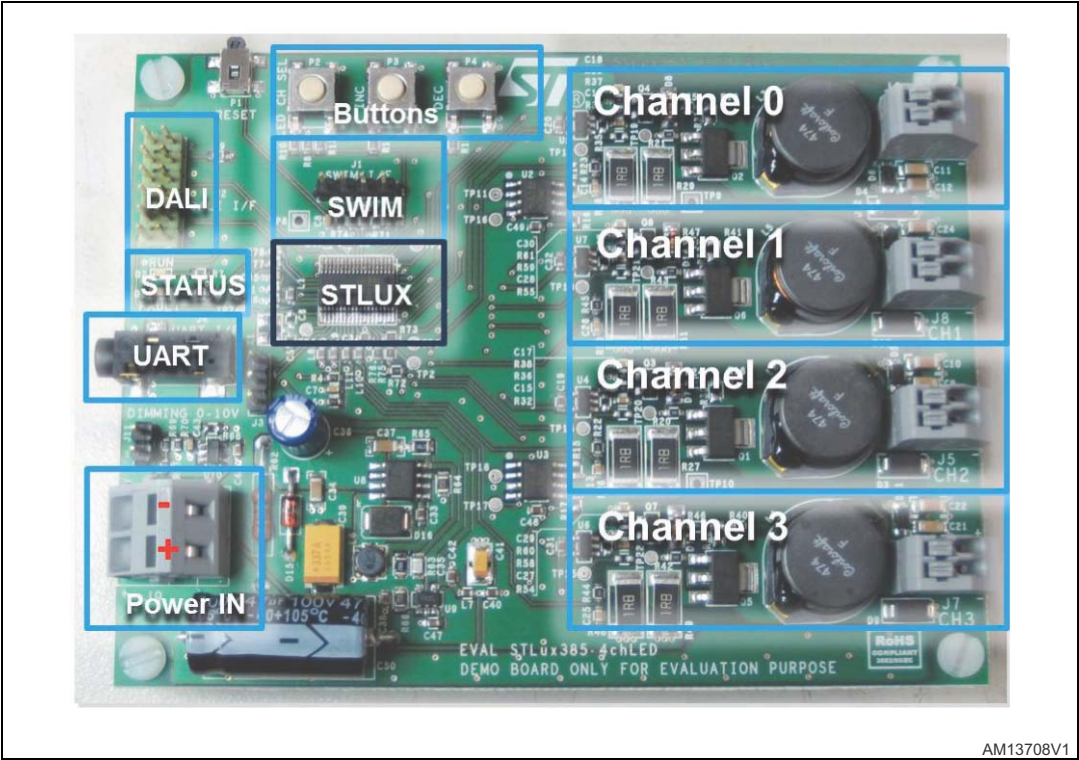
Description

The STEVAL385LED4CH demonstration board is a complete and configurable solution to manage four independent high brightness LED channels using the STLUX385A digital controller. The STLUX385A is part of STMicroelectronics' MASTERLUX product family and embeds advanced peripherals tailored to generate high resolution PWM signals (SMED).

The STEVAL385LED4CH implements inversed-buck topology to drive each LED channel. The SMED technology integrated in the STLUX385A

1 Board description

Figure 1. Jumper and connector location



AM13708V1

Table 1. Connector pinout

| Name | Function |
|---------------|--|
| Power IN (J9) | Input power connection. Range: 12-48 V. |
| DALI | DALI connector. Compatible with STEVAL-ILM001V1 demonstration board. |
| UART | Serial link. Connector: jack mono 3.5 MM. The UART cable is provided with the demonstration board. |
| SWIM | SWIM interface. |
| CH0 (J6) | LED string connector, channel 0. |
| CH1 (J8) | LED string connector, channel 1. |
| CH2 (J5) | LED string connector, channel 2. |
| CH3 (J7) | LED string connector, Channel 3. |

Figure 2. STEVAL385LED4CH - schematic 1 of 3

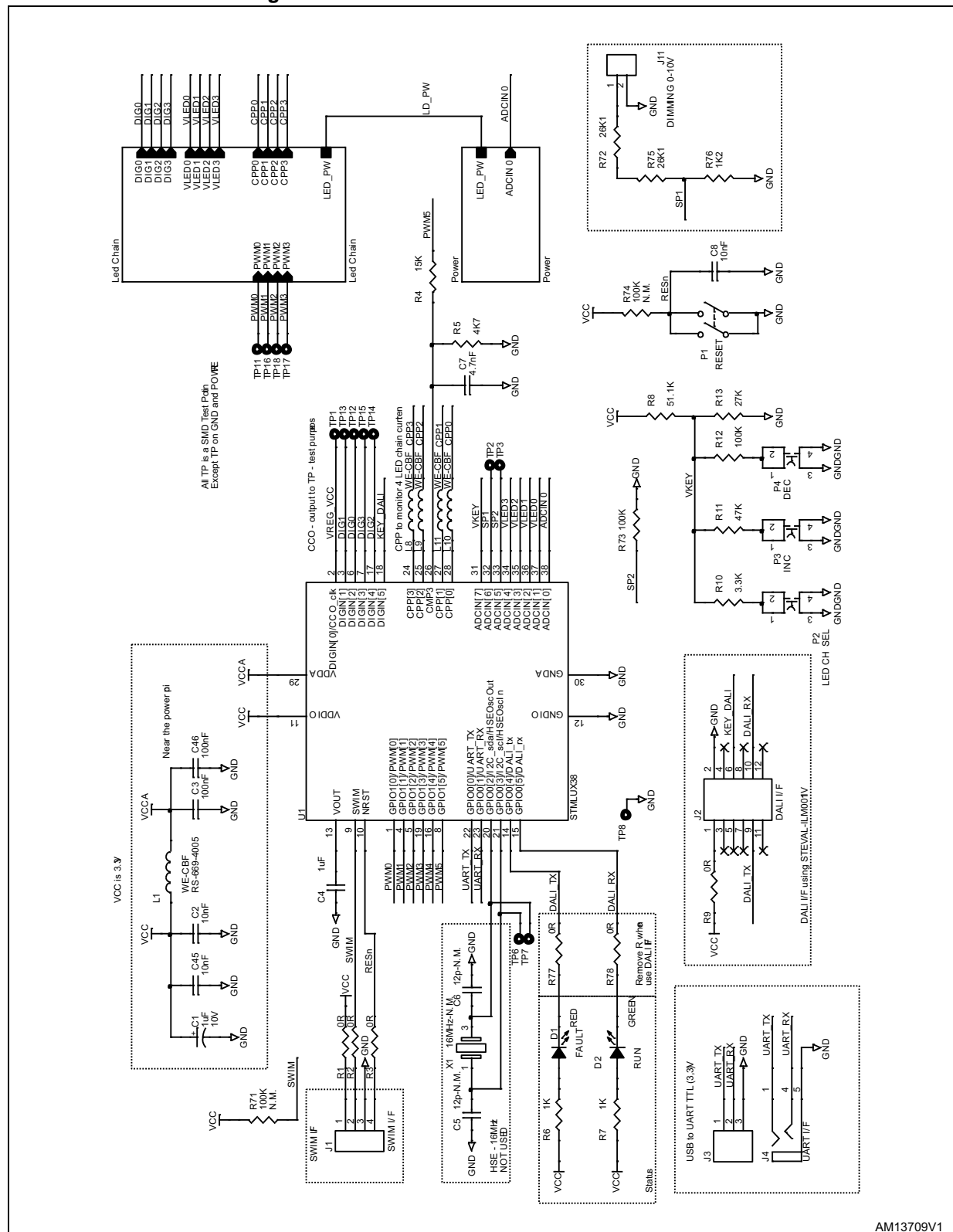
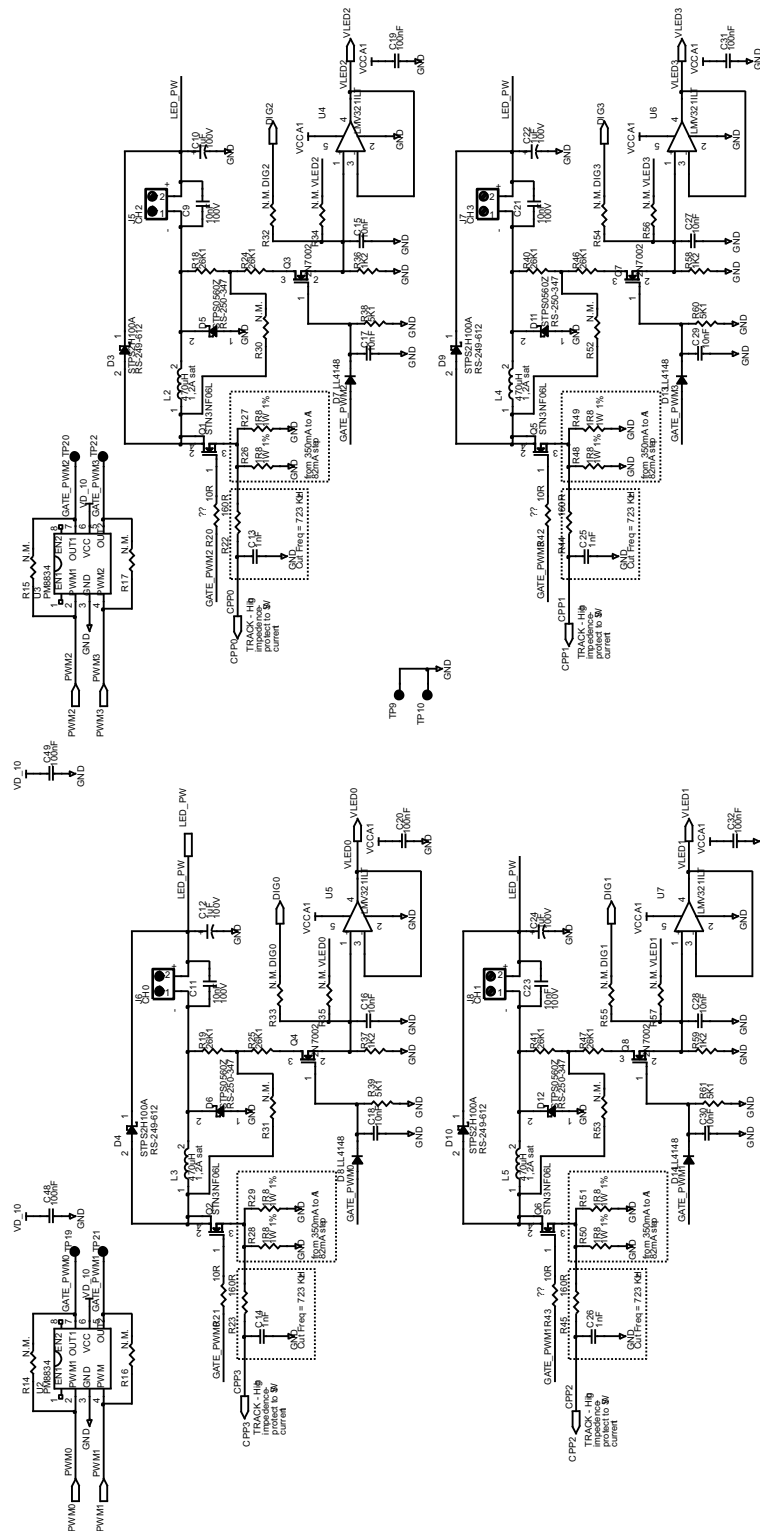
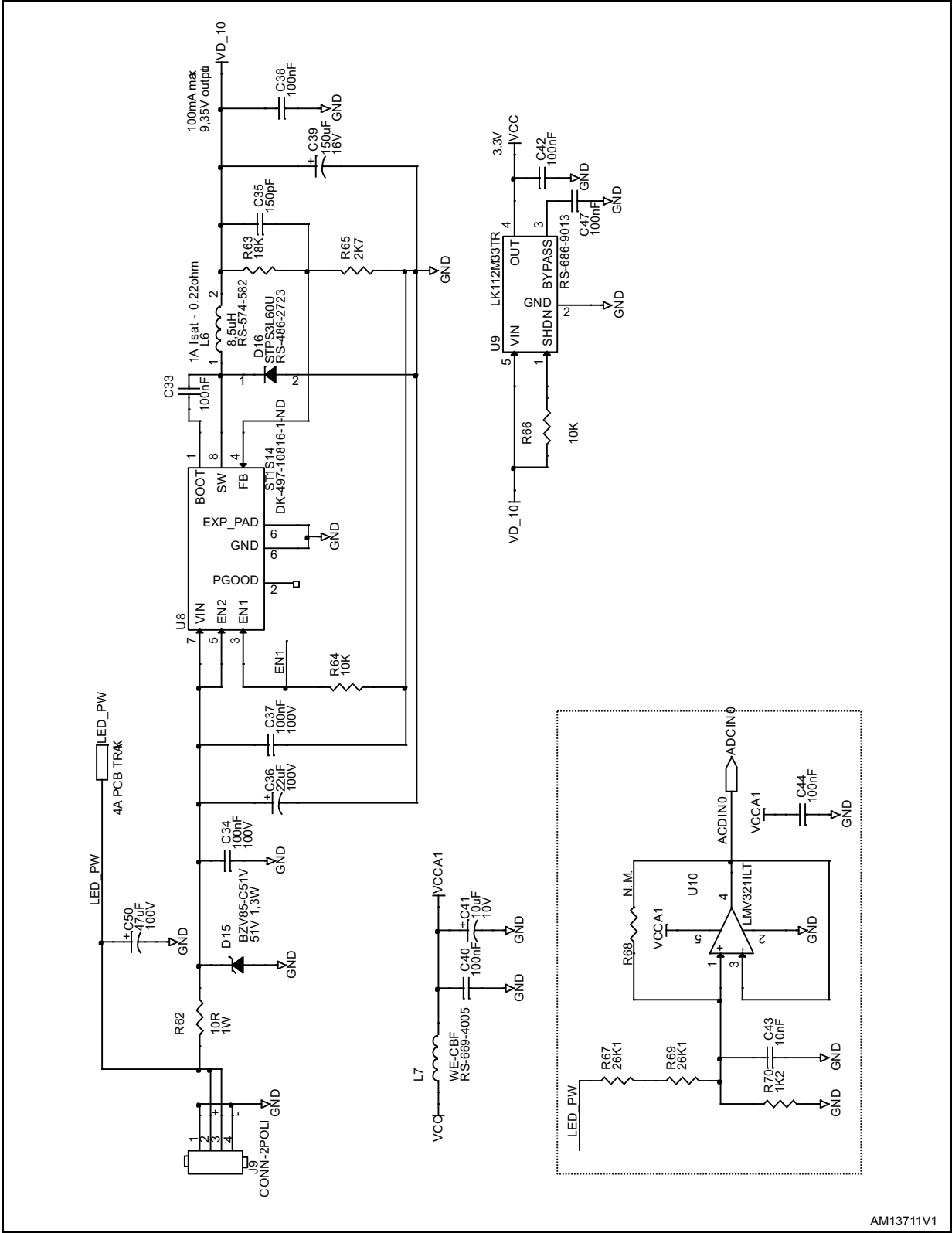


Figure 3. STEVAL385LED4CH - schematic 2 of 3



AM13710V1

Figure 4. STEVAL385LED4CH - schematic 3 of 3



2 Bill of material

Table 2. STEVAL385LED4CH - bill of material

| Item | Quantity | Reference | Part value | Decal | Note |
|------|----------|------------------------------|-------------------|----------------------------|-------------|
| 1 | 2 | C1,C4 | 1 μ F | capc-0603 | 10 V |
| 2 | 4 | C2,C8,C43,C45 | 10 nF | capc-0603 | |
| 3 | 8 | C3,C19,C20,C31,C32, C40, | 100 nF | capc-0603 | |
| | | C44,C46 | | | |
| 4 | 2 | C5,C6 | 12p-N.M. | capc-0603 | Not mounted |
| 5 | 1 | C7 | 4.7 nF | capc-0603 | |
| 6 | 4 | C9,C11,C21,C23 | 10 nF | capc-1206 | 100 V |
| 7 | 4 | C10,C12,C22,C24 | 1 μ F | capc-1206 | 100 V |
| 8 | 4 | C13,C14,C25,C26 | 1 nF | capc-0603 | |
| 9 | 8 | C15,C16,C17,C18,C27 ,C28, | 10 nF | capc-0603 | |
| | | C29,C30 | | | |
| 10 | 6 | C33,C38,C42,C47,C48 ,C49 | 100 nF | capc-0603 | 25 V |
| 11 | 2 | C34,C37 | 100 nF | capc-1206 | 100 V |
| 12 | 1 | C35 | 150 pF | capc-0805 | 25V |
| 13 | 1 | C36 | 22 μ F | D250P100 | 100 V |
| 14 | 1 | C39 | 150 μ F | capc-7343 | 16 V |
| 15 | 1 | C41 | 10 μ F | V-3216 | 10 V |
| 16 | 1 | C50 | 47 μ F | cap-axP1000D400 | 100 V |
| 17 | 1 | D1 | FAULT | ledc-0603 | |
| 18 | 1 | D2 | RUN | ledc-0603 | |
| 19 | 4 | D3,D4,D9,D10 | STPS2H100A | SMA | |
| 20 | 4 | D5,D6,D11,D12 | STPS0560Z | SOD123 | |
| 21 | 4 | D7,D8,D13,D14 | LL4148 | sod80-st | |
| 22 | 1 | D15 | BZV85-C51V | DO41 | 51 V 1,3 W |
| 23 | 1 | D16 | STPS3L60U | SMB | |
| 24 | 1 | J1 | SWIM I/F | 4PIN-P254 | |
| 25 | 1 | J2 | DALI I/F | PIN2X6P254 | |
| 26 | 1 | J3 | UART I/F - TTL | 3PIN-P254 | |
| 27 | 1 | J4 | UART I/F | JACK-3_5- 35RASMT2BHNTX | |

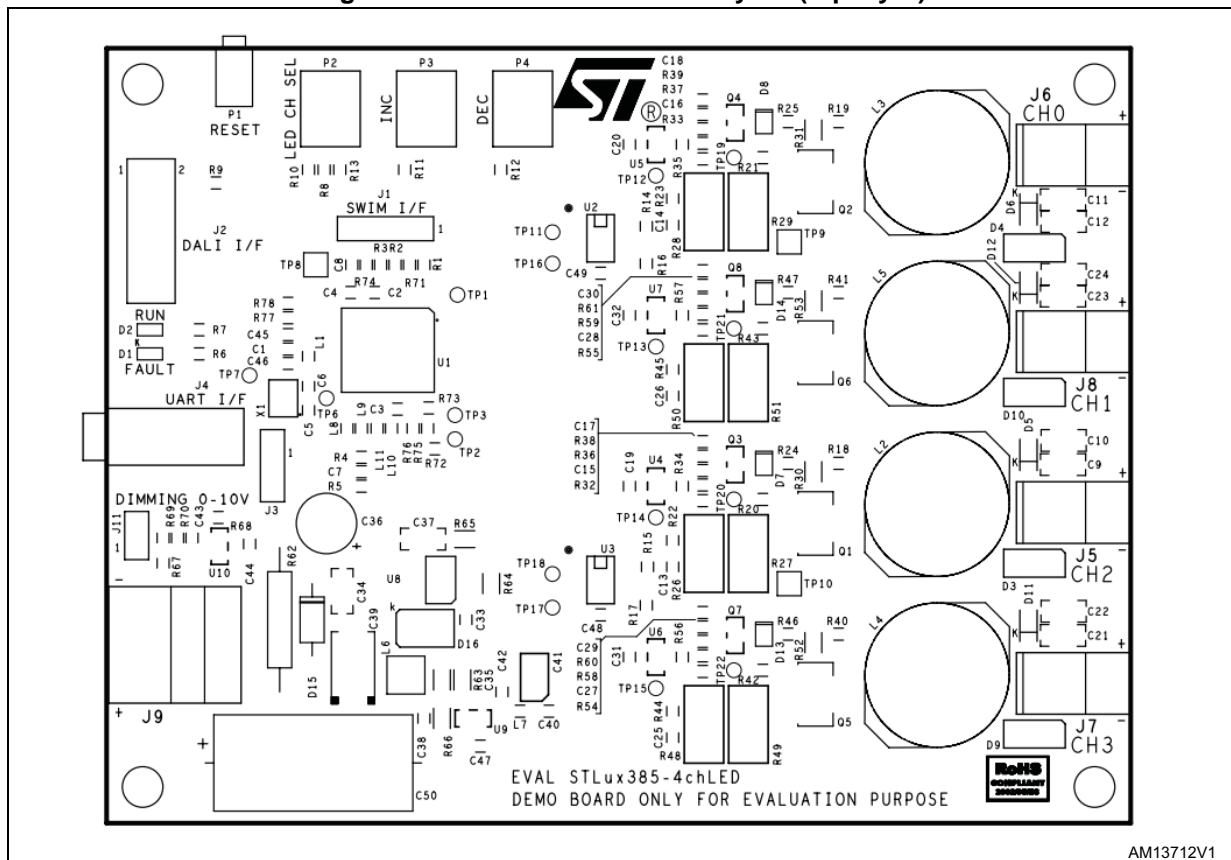
Table 2. STEVAL385LED4CH - bill of material (continued)

| Item | Quantity | Reference | Part value | Decal | Note |
|------|----------|--|----------------|------------------------|-------------|
| 28 | 1 | J5 | CH2 | MOR-2POLI-WAGO-250-402 | |
| 29 | 1 | J6 | CH0 | MOR-2POLI-WAGO-250-402 | |
| 30 | 1 | J7 | CH3 | MOR-2POLI-WAGO-250-402 | |
| 31 | 1 | J8 | CH1 | MOR-2POLI-WAGO-250-402 | |
| 32 | 1 | J9 | CONN-2POLI | MOR-2POLI-WAGO-236-402 | |
| 33 | 1 | J11 | DIMMING 0-10 V | 2PIN-P254 | |
| 34 | 2 | L1,L7 | WE-CBF | capc-0603 | |
| 35 | 4 | L2,L3,L4,L5 | 470 uH | DS5022P-Coilcraft | 1.2A sat |
| 36 | 1 | L6 | 8,5 uH | ELL4GG-Panasonic | |
| 37 | 4 | L8,L9,L10,L11 | WE-CBF | capc-0603 | |
| 38 | 1 | P1 | RESET | EVQPSM-Panasonic | |
| 39 | 1 | P2 | LED CH SEL | smd-switch-B3FS | |
| 40 | 1 | P3 | INC | smd-switch-B3FS | |
| 41 | 1 | P4 | DEC | smd-switch-B3FS | |
| 42 | 4 | Q1,Q2,Q5,Q6 | STN3NF06L | sot223 | |
| 43 | 4 | Q3,Q4,Q7,Q8 | 2N7002 | SOT23 | |
| 44 | 10 | R1,R2,R3,R9,R77,R34,R35, R56, R57,R68,R78 | 0R | resc-0603 | |
| 45 | 1 | R4 | 15 K | resc-0603 | |
| 46 | 1 | R5 | 4K7 | resc-0603 | |
| 47 | 2 | R6,R7 | 1 K | resc-0603 | |
| 48 | 1 | R8 | 51.1 K | resc-0603 | |
| 49 | 1 | R10 | 3.3 K | resc-0603 | |
| 50 | 1 | R11 | 47 K | resc-0603 | |
| 51 | 2 | R12,R73 | 100 K | resc-0603 | |
| 52 | 1 | R13 | 27 K | resc-0603 | |
| 53 | 8 | R14,R15,R16,R17,R32,R33, R54,R55 | Not mounted | resc-0603 | Not mounted |
| 54 | 12 | R18,R19,R24,R25,R40,R41, | 26K1 | resc-0603 | |

Table 2. STEVAL385LED4CH - bill of material (continued)

| Item | Quantity | Reference | Part value | Decal | Note |
|------|----------|--------------------------|-------------|-----------------|-------------|
| | | R46,R47,R67,R69,R72,R75 | | | |
| 55 | 4 | R20,R21,R42,R43 | 10R | resc-0603 | |
| 56 | 4 | R22,R23,R44,R45 | 160R | resc-0603 | |
| 57 | 8 | R26,R27,R28,R29,R48,R49, | 1R8 | R2512 | 1 W 1% |
| | | R50,R51 | | | |
| 58 | 4 | R30,R31,R52,R53 | Not mounted | resc-0805 | Not mounted |
| 59 | 6 | R36,R37,R58,R59,R70,R76 | 1K2 | resc-0603 | |
| 60 | 4 | R38,R39,R60,R61 | 5K1 | resc-0603 | |
| 61 | 1 | R62 | 10R | R700DIAM100 | 1 W |
| 62 | 1 | R63 | 18 K | resc-0805 | |
| 63 | 2 | R64,R66 | 10 K | resc-0805 | |
| 64 | 1 | R65 | 2K7 | resc-0805 | |
| 65 | 2 | R71,R74 | 100 K | resc-0603 | Not mounted |
| 66 | 1 | U1 | STMLUX38 | TSSOP38 | |
| 67 | 2 | U2,U3 | PM8834 | SOi8 | |
| 68 | 5 | U4,U5,U6,U7,U10 | LMV321ILT | sot23-5L | Not mounted |
| 69 | 1 | U8 | ST1S14 | SO8-ep-9 | |
| 70 | 1 | U9 | LK112M33TR | SOT23-5L | |
| 71 | 1 | X1 | 16 MHz-N.m. | X32-3_2x2_5-MEC | Not mounted |

Figure 5. STEVAL385LED4CH - layout (top layer)



3 Revision history

Table 3. Document revision history

| Date | Revision | Changes |
|-------------|----------|------------------|
| 04-Apr-2013 | 1 | Initial release. |

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