

## 12 V - 400 W adapter based on L4984, L6699 and SRK2001

Data brief



### Features

- Universal input mains voltage range: from 90 Vac to 264 Vac
  - frequency from 45 to 65 Hz
- Output voltage: 12 V at 33 A continuous operation
- Overall efficiency at full load: > 89%, according to **ENERGY STAR® 6.1** limit for computers
- Certified as **80Plus PLATINUM level at 115 Vac and GOLD level at 230 Vac** in the CLEAResult Plug Load Solutions website<sup>(1)</sup>
- Average efficiency: > 89%, according to **European CoC ver. 5 Tier 2** for external power supplies
- Efficiency at 250 mW > 50%, well above **EuP lot 6 Tier 2** limit for household and office equipment

1. CLEAResult Plug Load Solutions site is owned and maintained by CLEAResult - the largest provider of energy efficiency programs and services in North America:  
<https://www.plugloadsolutions.com/80PlusPowerSuppliesDetail.aspx?id=238&type=4>

- No load mains consumption: < 150 mW at 230 Vac, well below **European CoC ver. 5 Tier 2** limit for external power supplies
- Mains harmonics: meets EN61000-3-2 Class-D and JEITA-MITI Class-D
- EMI: according to EN55022 Class-B
- Safety: meets EN60950 standards
- RoHS compliant

### Description

The EVL400W-EUPL7 demonstration board is a 12 V - 400 W converter, tailored for the typical specification of an AC/DC adapter with wide input mains range, very low power consumption at light load and good average efficiency.

The architecture is based on a two-stage approach: a front-end PFC pre-regulator based on a CCM (continuous conduction mode) boost PFC controller using the L4984, and a downstream LLC resonant half-bridge converter, designed around the L6699.

At the secondary side, synchronous rectification is implemented by means of the SRK2001 that assures a very high rectification efficiency with consequent small Heat Sink required.

The PFC section uses a proprietary LM-FOT (line-modulated fixed-off-time) that allows control methodology at fixed frequency operation for boost PFC converters as long as its operating in CCM.

The LLC section uses the L6699, a double-ended controller specific to series-resonant half-bridge topology. The output voltage regulation is obtained by modulating the operating frequency.

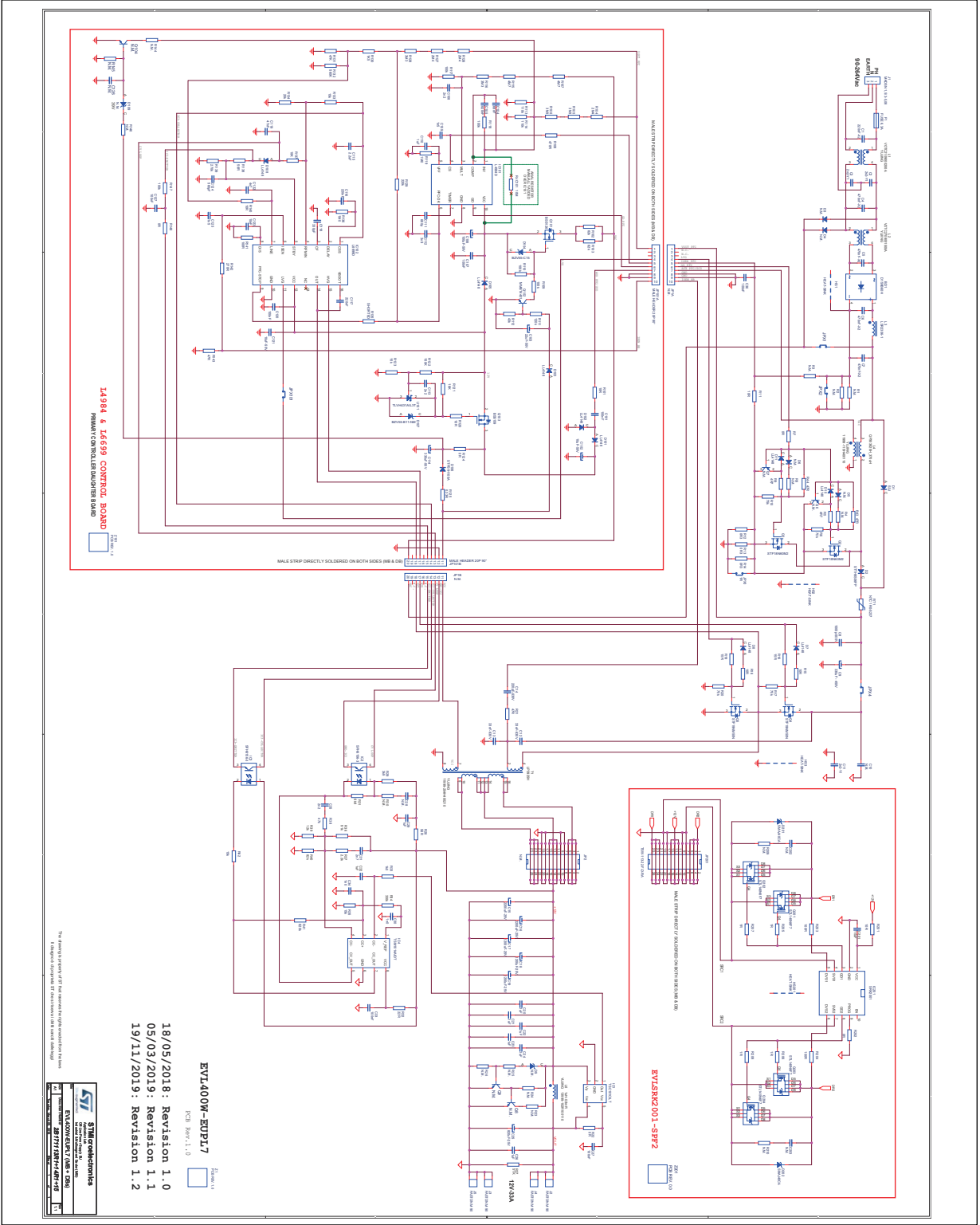
The main focus of this demonstration board is the light-load efficiency, achieved through the burst mode function of both PFC and LLC controllers with the self-adaptive deadtime of the L6699, modulated by the internal logic according to the

half-bridge node transition times, which allows the maximization of the transformer magnetizing inductance, reducing the primary current at light load operation.

An active high voltage start-up circuitry based on a depletion MOSFET provides a very fast start-up time and minimizes the residual consumption during normal operation to a negligible level.

1 Electrical diagram

Figure 1. EVL400W-EUPL7 electrical diagram



## 2 Bill of material

Table 1. EVL400W-EUPL7 motherboard BOM

| Reference                         | Value        | Description                                          | Package               | Manuf. code        | Manufacturer       |
|-----------------------------------|--------------|------------------------------------------------------|-----------------------|--------------------|--------------------|
| BD1                               | D15XB60H     | Single phase bridge rectifier                        | 5S                    | D15XB60H           | SHINDENGEN         |
| C1                                | 220nF-X2     | X2 - film cap - R46 series, class X2, 310 Vac, 110°C | 6 x 26.5 h 15 p22.5mm | R463N322000M1M     | KEMET              |
| C2, C3, C11                       | 2n2-Y1       | Y1 safety cap. DE1E3KX222M                           | p10mm                 | DE1E3KX222M        | MURATA             |
| C4, C5, C6                        | 470nF-X2     | X2 - film cap - R46 series, class X2, 310 Vac, 110°C | 7 x 26.5 p22.5mm      | R463N347000N0M     | KEMET              |
| C7                                | 470nF-X2     | X2 - film cap - R46 series, class X2, 275 VAC, 110°C | 10 x 18 h16 p15mm     | R46KI347000N0M     | KEMET              |
| C8                                | 1000p-500V   | 500Vac CERCAP - 1206                                 | 1206                  |                    | VISHAY             |
| C9                                | 330uF - 450V | Aluminum ELCAP - 330uF-450V 20% - LLG2W331MELA45     | DIA 25 x 45 mm        | LLG2W331MELA45     | NICHICON           |
| C10                               | N.M.         | Y1 safety cap. DE1E3KX222M                           | p10mm                 | DE1E3KX222M        | MURATA             |
| C12, C13                          | 33nF-630V    | 630Vdc cap. - B32652A6333                            | 5 x 18 h10.5 p15mm    | B32652A6333        | EPCOS              |
| C14                               | 220pF-630V   | 630V CERCAP - GRM31A7U2J221JW31                      | 1206                  |                    | MURATA             |
| C15, C16, C17, C18, C19           | 2200uF-25V   | ELCAP KZE series- EKZE250ELL222MK35S                 | 12.5 x 35mm           | EKZE250ELL222MK35S | NIPPON CHEMI-CON   |
| C20, C21, C22, C23, C24, C26, C29 | 1uF          | 50V CERCAP - X7R - 10%                               | 1206                  |                    | TDK                |
| C25                               | 820uF-25V    | 25V aluminum cap - EEUTP1E821                        | DIA 10 x 20mm         | EEUTP1E821         | PANASONIC          |
| C27, C33, C36                     | 100nF        | 50V CERCAP - general purpose                         | 805                   |                    | AVX                |
| C28                               | N.M.         | 50V CERCAP - general purpose                         | 805                   |                    | AVX                |
| C30, C34                          | 1n0          | 50V CERCAP - general purpose                         | 805                   |                    | AVX                |
| C31                               | 2n7          | 50V CERCAP - general purpose                         | 805                   |                    | AVX                |
| C32                               | 1uF          | 50V CERCAP - general purpose                         | 805                   |                    | AVX                |
| C35                               | 2n2          | 50V CERCAP - C0G - 10%                               | 805                   |                    | AVX                |
| D1                                | S3J          | General purpose rectifier 600V 3A                    | SMC (DO-214AB)        | S3J                | ON SEMI            |
| D2                                | STTH8S06FP   | Ultrafast high voltage rectifier                     | TO220FPAC             |                    | STMicroelectronics |
| D3, D4                            | N.M.         | General purpose rectifier, SMT                       | DO214AC               |                    | FAIRCHILD          |
| D5, D6                            | N.M.         | High speed signal diode                              | MINIMELF SOD-80       |                    | VISHAY             |

Table 1. EVL400W-EUPL7 motherboard BOM (continued)

| Reference        | Value             | Description                                                      | Package           | Manuf. code           | Manufacturer       |
|------------------|-------------------|------------------------------------------------------------------|-------------------|-----------------------|--------------------|
| D7, D8, D10, D11 | LL4148            | High speed signal diode                                          | MINIMELF SOD-80   |                       | VISHAY             |
| D9               | N.M.              | High junction temperature Transil™                               | MINIMELF SOD-80   |                       | STMicroelectronics |
| F1               | FUSE 6.3A         | Fuse TR5/TE5 250V - 6.3A                                         | 8.5x4 p.5.08mm    |                       | LITTLEFUSE         |
| HS1              | HEAT-SINK         | Heat Sink for BD1                                                | PADA_8359_85      |                       |                    |
| HS2              | HEAT-SINK         | Heat Sink for Q2,Q3,D2                                           | PADA_8359_85      |                       |                    |
| HS3              | HEAT-SINK         | Heat Sink for Q4, Q5                                             | DWG               |                       |                    |
| IC1              | TSC101CILT        | High side current sense amplifier                                | SOT23-5           |                       | STMicroelectronics |
| IC2, IC3         | SFH6156-3         | Optocoupler, Phototransistor Output, High Reliability, 5300 VRMS | SMD-4             | SFH6156-3             | VISHAY             |
| IC4              | TSM1014AIDT       | Low consumption CV/CC controller                                 | SO-8              |                       | STMicroelectronics |
| JPX1, JPX2, JPX4 | SHORTED           | Wire jumper (see Mech Parts)                                     | PTH               |                       |                    |
| JPX3             | 1R                | RSMF1TB - metal film res - 1W - 2% - 250ppm/°C                   | PTH               | RSMF1TB 1R0 G PB-FREE | AKANEOHM           |
| JP1              | N.M.              | Female header p.2,54mm PRECI-DIP                                 | DWG               |                       |                    |
| JP2              | N.M.              | 13x2p Straight Female Receptacle SSQ Series                      | 13x2 p2.54mm      | SSQ-113-02-G-D        | SAMTEC             |
| J1               | MKDSN 1,5/ 3-5,08 | PCB TERM. BLOCK, SCREW CONN., PITCH 5.08mm - 3 W.                | DWG               |                       | PHOENIX CONTACT    |
| J2, J3, J4, J5   | FASTON M 90       | FASTON - CONNECTOR                                               | FASTON PCB        | 63951-1               | TE Connectivity    |
| L1               | VOTC2109000 200A  | Input EMI filter 2mHx2 - 4.7A                                    | 22 x 21 mm        | VOTC210900020 0A      | YUJING             |
| L2               | VOTC2708001 500A  | Input EMI filter 15mHx2 - 3.7A                                   | 28 x 24.5 mm      | VOTC270800150 0A      | YUJING             |
| L3               | LSR2306-1         | 51uH-6A DM Inductor                                              | DWG               | LSR2306-1             | DELTA ELECTRONICS  |
| L4               | QP303825H_3 70uH  | PFC inductor QP3038-25H-370uH-40-70kHz                           | DWG               | 11999-115H400110      | YUJING             |
| L6               | 1uH-0.8mR         | Output ripple filter inductor                                    | p 16mm - dia 14mm | 13999-102R100110      | YUJING             |
| Q2, Q3           | STF18N60M2        | N-channel Power MOSFET                                           | TO-220FP          |                       | STMicroelectronics |
| Q4, Q5           | STF19NM50N        | N-channel Power MOSFET                                           | TO-220FP          |                       | STMicroelectronics |
| Q6, Q7           | N.M.              | PNP general purpose amplifier                                    | SOT-23            |                       | FAIRCHILD          |
| Q8, Q9           | N.M.              | NPN small signal BJT                                             | SOT-23            |                       | VISHAY             |

Table 1. EVL400W-EUPL7 motherboard BOM (continued)

| Reference                  | Value        | Description                                    | Package | Manuf. code            | Manufacturer |
|----------------------------|--------------|------------------------------------------------|---------|------------------------|--------------|
| RT1                        | NTC 1R0-S237 | NTC resistor P/N B57237S0109M000               | DWG     | B57237S0109M           | EPCOS        |
| R1, R2                     | N.M.         | Not mounted                                    | PTH     |                        |              |
| R3                         | N.M.         | SMD standard film res - 1/4W - 5% - 250ppm/°C  | 1206    |                        | VISHAY       |
| R4, R8, R23, R24, R25, R26 | N.M.         | SMD standard film res - 1/8W - 5% - 200ppm/°C  | 805     |                        | VISHAY       |
| R5, R9                     | 4R7          | SMD standard film res - 1/8W - 5% - 200ppm/°C  | 805     |                        | VISHAY       |
| R6, R10, R17, R20          | 75k          | SMD standard film res - 1/8W - 1% - 100ppm/°C  | 805     |                        | VISHAY       |
| R7                         | 0R           | SMD standard film res - 1/8W - 5% - 250ppm/°C  | 805     |                        | VISHAY       |
| R11                        | 10R          | SMD standard film res - 1/4W - 5% - 250ppm/°C  | 1206    |                        | VISHAY       |
| R12, R13, R14              | 0R3          | RSMF1TB - metal film res - 1W - 2% - 250ppm/°C | PTH     | RSMF1TB 0R30 G PB-FREE | AKANEOHM     |
| R15, R18                   | 10R          | SMD standard film res - 1/8W - 5% - 250ppm/°C  | 805     |                        | VISHAY       |
| R43, R44                   | 47R          | SMD standard film res - 1/8W - 5% - 250ppm/°C  | 805     |                        | VISHAY       |
| R16, R19                   | 15R          | SMD standard film res - 1/8W - 5% - 250ppm/°C  | 805     |                        | VISHAY       |
| R21                        | 47R          | PTH standard film res - 1/8W - 5% - 200ppm/°C  | PTH     |                        | VISHAY       |
| R22                        | 0R           | SMD standard film res - 1/8W - 5% - 200ppm/°C  | 805     |                        | VISHAY       |
| R27                        | 51K          | SMD standard film res - 1/4W - 5% - 250ppm/°C  | 1206    |                        | VISHAY       |
| R28                        | 56R          | SMD standard film res - 1/8W - 5% - 250ppm/°C  | 805     |                        | VISHAY       |
| R29                        | 3k9          | SMD standard film res - 1/8W - 5% - 250ppm/°C  | 805     |                        | VISHAY       |
| R30                        | N.M.         | SMD standard film res - 1/8W - 1% - 100ppm/°C  | 805     |                        | VISHAY       |
| R31                        | 6k8          | SMD standard film res - 1/8W - 1% - 100ppm/°C  | 805     |                        | VISHAY       |
| R32                        | 22R          | SMD standard film res - 1/8W - 5% - 200ppm/°C  | 805     |                        | VISHAY       |
| R33                        | 1k0          | SMD standard film res - 1/8W - 5% - 250ppm/°C  | 805     |                        | VISHAY       |

Table 1. EVL400W-EUPL7 motherboard BOM (continued)

| Reference | Value   | Description                                   | Package | Manuf. code      | Manufacturer |
|-----------|---------|-----------------------------------------------|---------|------------------|--------------|
| R34       | 330k    | SMD standard film res - 1/8W - 1% - 100ppm/°C | 805     |                  | VISHAY       |
| R35, R42  | 15k     | SMD standard film res - 1/8W - 1% - 100ppm/°C | 805     |                  | VISHAY       |
| R36       | 91k     | SMD standard film res - 1/8W - 1% - 100ppm/°C | 805     |                  | VISHAY       |
| R37       | 2.2k    | SMD standard film res - 1/8W - 1% - 100ppm/°C | 805     |                  | VISHAY       |
| R38       | 47k     | SMD standard film res - 1/8W - 5% - 250ppm/°C | 805     |                  | VISHAY       |
| R39       | 12k     | SMD standard film res - 1/8W - 1% - 100ppm/°C | 805     |                  | VISHAY       |
| R40       | 82k     | SMD standard film res - 1/8W - 1% - 100ppm/°C | 805     |                  | VISHAY       |
| R41       | 820k    | SMD standard film res - 1/8W - 5% - 200ppm/°C | 805     |                  | VISHAY       |
| T1        | LP3925H | Resonant power transformer - LP3925H          | DWG     | 11999-204H400210 | YUJING       |

Table 2. EVL400W-EUPL7 control board BOM

| Reference  | Value     | Description                         | Package             | Manuf. code         | Manufacturer |
|------------|-----------|-------------------------------------|---------------------|---------------------|--------------|
| C101       | 100nF     | 100V CERCAP - general purpose       | 1206                |                     | AVX          |
| C102       | 10uF-50V  | Aluminum ELCAP - YXF series - 105°C | DIA 5.0 x 11 p2mm   | 50YXF10MEFC5 X11    | RUBYCON      |
| C103       | 22uF-50V  | 50V-ELCAP SK Type tol 20%           | DIA 5 x 11 p 2mm    | SK050M0022B2F -0511 | YAGEO        |
| C104       | 68nF      | 50V CERCAP - general purpose        | 805                 |                     | AVX          |
| C105       | 820nF     | 25V CERCAP - general purpose        | 1206                |                     | AVX          |
| C106       | 100uF-50V | Aluminum ELCAP - YXF series - 105°C | DIA 8 x 11.5 p3.5mm | 50YXF100MEFC8 X11.5 | RUBYCON      |
| C107, C127 | 100nF     | 50V CERCAP - general purpose        | 805                 |                     | AVX          |
| C108, C113 | 2n2       | 50V CERCAP - C0G - 10%              | 805                 |                     | AVX          |
| C109, C125 | 1n5       | 50V CERCAP - general purpose        | 805                 |                     | AVX          |
| C110       | 1uF       | CERCAP - 25V - X7R - 10%            | 805                 |                     | AVX          |
| C111       | 680p      | 50V CERCAP - general purpose        | 805                 |                     | AVX          |
| C112       | 3n9       | 50V CERCAP - general purpose        | 805                 |                     | AVX          |
| C114       | 330uF-50V | Aluminum ELCAP - 105°C              | DIA10 x 16 p5mm     | ECA-1HHG331         | PANASONIC    |
| C115       | 2.2uF     | 25V CERCAP - general purpose        | 1206                |                     | AVX          |

Table 2. EVL400W-EUPL7 control board BOM (continued)

| Reference                          | Value                     | Description                                      | Package            | Manuf. code             | Manufacturer           |
|------------------------------------|---------------------------|--------------------------------------------------|--------------------|-------------------------|------------------------|
| C116, C117                         | 220nF                     | 25V CERCAP - general purpose                     | 805                |                         | AVX                    |
| C118                               | 330pF                     | 50V CERCAP - general purpose                     | 805                |                         | AVX                    |
| C119                               | 47nF                      | 50V CERCAP - general purpose                     | 805                |                         | AVX                    |
| C120                               | 100nF                     | 50V CERCAP - general purpose                     | 1206               |                         | AVX                    |
| C121                               | 10uF-50V                  | 50V CERCAP - general purpose                     | 1210               | C3225X7S1H106<br>M250AB | TDK                    |
| C122                               | 4n7                       | 50V CERCAP - general purpose                     | 805                |                         | AVX                    |
| C123                               | 10nF                      | 50V CERCAP - general purpose                     | 805                |                         | AVX                    |
| C124                               | 560pF                     | 50V CERCAP - general purpose                     | 805                |                         | AVX                    |
| C126                               | N.M.                      | 50V CERCAP - X7R - 10%                           | 805                |                         | AVX                    |
| D101, D102,<br>D103, D105,<br>D108 | LL4148                    | High speed signal diode                          | MINIMELF<br>SOD-80 |                         | VISHAY                 |
| D104                               | BZV55-C15                 | ZENER diode                                      | MINIMELF<br>SOD-80 |                         | VISHAY                 |
| D106                               | STPS1H100A                | Power Schottky diode                             | SMA-DO-<br>214AC   |                         | STMicroelectr<br>onics |
| D107                               | BZV55-B11-NM              | ZENER diode                                      | MINIMELF<br>SOD-80 |                         | VISHAY                 |
| D109                               | N.M.                      | ZENER diode                                      | SOD-123            |                         | DIODES                 |
| IC101                              | L4984D                    | CCM PFC CONTROLLER                               | SSOP10             |                         | STMicroelectr<br>onics |
| R-IC101                            | 10M                       | 1/8W Axial Resistor                              | PTH                |                         | VISHAY                 |
| IC102                              | L6699D                    | Improved HV resonant controller                  | SO-16              |                         | STMicroelectr<br>onics |
| JPX101                             | SHORTED                   | Wire jumper                                      | PTH                |                         |                        |
| JP101                              | MALE<br>HEADER 20P<br>90° | Male header p.2,54mm 90°                         | DWG                |                         |                        |
| Q101                               | BSS126                    | N-CH depletion MOSFET                            | SOT-23             | BSS126                  | INFINEON               |
| Q102                               | MMBT4401                  | NPN small signal BJT                             | SOT-23             |                         | VISHAY                 |
| Q103                               | BSS159                    | N-CH depletion MOSFET                            | SOT-23             | BSS159                  | INFINEON               |
| Q104                               | N.M.                      | NPN small signal BJT                             | SOT-23             |                         | VISHAY                 |
| R101, R140                         | 10R                       | SMD standard film res - 1/4W - 1% -<br>100ppm/°C | 1206               |                         | VISHAY                 |
| R102, R103                         | 62k                       | SMD standard film res - 1/4W - 1% -<br>100ppm/°C | 1206               |                         | VISHAY                 |
| R104, R126                         | 2M4                       | Standard film res - 1/8W - 1% - 100ppm/°C        | PTH                |                         | VISHAY                 |

Table 2. EVL400W-EUPL7 control board BOM (continued)

| Reference              | Value | Description                                   | Package | Manuf. code | Manufacturer |
|------------------------|-------|-----------------------------------------------|---------|-------------|--------------|
| R105, R106, R116, R128 | 2M4   | SMD standard film res - 1/4W - 1% - 100ppm/°C | 1206    |             | VISHAY       |
| R127                   | 2M4   | SMD standard film res - 1/4W - 1% - 100ppm/°C | 1206    |             | VISHAY       |
| R107, R115             | 4M7   | SMD standard film res - 1/4W - 1% - 100ppm/°C | 1206    |             | VISHAY       |
| R108                   | 470R  | SMD standard film res - 1/8W - 1% - 100ppm/°C | 805     |             | VISHAY       |
| R109                   | 100k  | SMD standard film res - 1/4W - 5% - 250ppm/°C | 1206    |             | VISHAY       |
| R110, R117, R118, R147 | 100k  | SMD standard film res - 1/8W - 1% - 100ppm/°C | 805     |             | VISHAY       |
| R111                   | 120k  | SMD standard film res - 1/8W - 1% - 100ppm/°C | 805     |             | VISHAY       |
| R112                   | 43k   | SMD standard film res - 1/8W - 1% - 100ppm/°C | 805     |             | VISHAY       |
| R113, R114             | 110k  | SMD standard film res - 1/8W - 1% - 100ppm/°C | 805     |             | VISHAY       |
| R119, R136             | 1M0   | SMD standard film res - 1/8W - 1% - 100ppm/°C | 805     |             | VISHAY       |
| R120                   | 10R   | SMD standard film res - 1/8W - 5% - 200ppm/°C | 805     |             | VISHAY       |
| R121                   | 16K   | SMD standard film res - 1/8W - 5% - 200ppm/°C | 805     |             | VISHAY       |
| R122                   | 150K  | SMD standard film res - 1/8W - 1% - 100ppm/°C | 805     |             | VISHAY       |
| R123                   | 15k   | SMD standard film res - 1/8W - 1% - 100ppm/°C | 805     |             | VISHAY       |
| R124                   | 0R    | SMD standard film res - 1/4W - 5% - 250ppm/°C | 1206    |             | VISHAY       |
| R125                   | 0.33R | SMD standard film res - 1/4W - 5% - 250ppm/°C | 1206    |             | VISHAY       |
| R129                   | 220k  | SMD standard film res - 1/8W - 1% - 100ppm/°C | 805     |             | VISHAY       |
| R130                   | 1K5   | SMD standard film res - 1/8W - 1% - 100ppm/°C | 805     |             | VISHAY       |
| R131                   | 47K   | SMD standard film res - 1/8W - 1% - 100ppm/°C | 805     |             | VISHAY       |
| R132                   | 560K  | SMD standard film res - 1/8W - 1% - 100ppm/°C | 805     |             | VISHAY       |
| R133                   | 15k   | SMD standard film res - 1/8W - 1% - 100ppm/°C | 805     |             | VISHAY       |

Table 2. EVL400W-EUPL7 control board BOM (continued)

| Reference        | Value        | Description                                   | Package | Manuf. code | Manufacturer       |
|------------------|--------------|-----------------------------------------------|---------|-------------|--------------------|
| R134             | 20k          | SMD standard film res - 1/8W - 1% - 100ppm/°C | 805     |             | VISHAY             |
| R135             | SHORTED      | Wire jumper                                   | PTH     |             |                    |
| R137             | 10K          | SMD standard film res - 1/8W - 1% - 100ppm/°C | 805     |             | VISHAY             |
| R138             | 56R          | SMD standard film res - 1/8W - 1% - 100ppm/°C | 805     |             | VISHAY             |
| R139             | 270k         | SMD standard film res - 1/8W - 1% - 100ppm/°C | 805     |             | VISHAY             |
| R141             | 100R         | SMD standard film res - 1/8W - 5% - 200ppm/°C | 805     |             | VISHAY             |
| R142             | 270R         | SMD standard film res - 1/8W - 1% - 100ppm/°C | 805     |             | VISHAY             |
| R143             | 47R          | SMD standard film res - 1/8W - 1% - 100ppm/°C | 805     |             | VISHAY             |
| R144, R145, R146 | N.M.         | SMD standard film res - 1/8W - 5% - 200ppm/°C | 805     |             | VISHAY             |
| R148             | 0R           | SMD standard film res - 1/8W - 1% - 100ppm/°C | 805     |             | VISHAY             |
| U101             | TLVH431AIL3T | 1.24V programmable shunt voltage reference    | SOT-23  |             | STMicroelectronics |

Table 3. EVL400W-EUPL7 rectification board BOM

| Reference              | Value             | Description                                   | Package       | Manuf. code       | Manufacturer       |
|------------------------|-------------------|-----------------------------------------------|---------------|-------------------|--------------------|
| C201                   | 10uF              | 35V CERCAP X5R - general purpose              | 1206          |                   | TDK                |
| C202, C203             | N.M.              | 100V CERCAP - X7R - 10%                       | 1206          |                   | TDK                |
| D201, D202             | SMAJ40CA          | High junction temperature Transil™            | DO-214AC      |                   | STMicroelectronics |
| HS201                  | Heat Sink         | Heat Sink for Q201,Q202,Q203,Q204             | DWG           |                   |                    |
| IC201                  | SRK2001           | SRK2001 SR controller                         | SSOP10        | SRK2001           | STMicroelectronics |
| JP201                  | TSW-113-22-F-D-RA | 13x2p right angle male header TSW series      | 13x2 p2.54mm  | TSW-113-22-F-D-RA | SAMTEC             |
| Q201, Q202, Q203, Q204 | STL140N6F7        | N-channel Power MOSFET                        | PowerFLAT 5x6 | STL140N6F7        | STMicroelectronics |
| R201                   | 10R               | SMD standard film res - 1/4W - 1% - 100ppm/°C | 1206          |                   | VISHAY             |
| R202                   | 0R                | SMD standard film res - 1/8W - 5% - 250ppm/°C | 805           |                   | VISHAY             |

Table 3. EVL400W-EUPL7 rectification board BOM (continued)

| Reference              | Value | Description                                   | Package | Manuf. code | Manufacturer |
|------------------------|-------|-----------------------------------------------|---------|-------------|--------------|
| R203, R204             | 100R  | SMD standard film res - 1/8W - 5% - 250ppm/°C | 805     |             | VISHAY       |
| R205, R206, R207, R208 | 1R    | SMD standard film res - 1/8W - 5% - 250ppm/°C | 805     |             | VISHAY       |
| R209, R210             | N.M.  | SMD standard film res - 1/4W - 5% - 250ppm/°C | 1206    |             | VISHAY       |

### 3 Revision history

**Table 4. Document revision history**

| Date        | Revision | Changes                                                                                                                                                                                                    |
|-------------|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 22-May-2019 | 1        | Initial release                                                                                                                                                                                            |
| 31-May-2019 | 2        | Updated cover image on page 1                                                                                                                                                                              |
| 05-Dec-2019 | 3        | Updated Features <a href="#">on page 1</a> .<br>Changed R127 from 3.3 MΩ to 2.4 MΩ on the Schematic<br>( <a href="#">Figure 1. on page 3</a> ) and in the BOM ( <a href="#">Table 2. on page 7</a> ).Rev 3 |

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