

LT8624S 18V, 4A Synchronous Step-Down Silent Switcher with Ultra-Low Noise Reference

General Description

The demonstration circuit EVAL-LT8624S-AZ is a 18V, 4A synchronous step-down Silent Switcher 3 with ultra-low noise, high efficiency, and power density featuring the LT8624S. The input voltage range of EVAL-LT8624S-AZ is 2.7V to 18V. The default demo board setting is 1.0V at 4A maximum DC output current. The LT8624S is a compact, ultra-low noise, ultra-low emission, high efficiency, and high speed synchronous monolithic stepdown switching regulator. The uniquely designed combination of the ultra-low noise reference and thirdgeneration Silent Switcher architecture enables the LT8624S to achieve both high efficiency and excellent wideband noise performance. Minimum on-time of 12ns allows high V_{IN} to low V_{OUT} conversion at high frequency.

Program the LT8624S switching frequency either through the oscillator resistor or external clock over a 300kHz to 6MHz range. The default frequency of demo circuit EVALLT8624S-AZ is 2MHz. The SYNC pin on the demo board is grounded by default for low ripple pulse skip mode operation. To synchronize to an external clock, move JP1 to SYNC and apply the external clock to the SYNC terminal. Select the forced continuous mode (FCM) respectively by moving the JP1 shunt. Figure 1 shows the efficiency of the circuit at 5V input and 12V input in the force continuous mode operation (input from VIN terminal). Figure 2 shows the LT8624S temperature rising on the EVAL-LT8624S-AZ demo board under 3A and 4A load conditions.

The demo board has an EMI filter installed. This EMI filter can be included by applying the input voltage at the $V_{\text{IN_EMI}}$ terminal. Figure 3 shows the EMI performance of the board. The red line in Radiated EMI Performance is the CISPR32 Class B limit. In addition to the excellent EMI performance, the regulator also features ultra-low noise over a wide frequency range, as shown in Figure 4.

The LT8624S data sheet gives a complete description of the part, including operation and application information. Read the data sheet in conjunction with this demo manual for demo circuit EVAL-LT8624S-AZ. The LT8624S is assembled in a 4mm x 3mm LQFN package with exposed ground pads for low thermal resistance. The layout recommendations for low EMI operation and maximum thermal performance are available in the data sheet section 'Low EMI PCB Layout and Thermal Considerations'.

Design files for this circuit board are available.

Performance Summary Specifications are at T_A = 25°C

| PARAMETER | CONDITIONS | MIN | TYP | MAX | UNITS |
|-------------------------------------|--|-------|-----|-------|-------|
| Input Voltage Range V _{IN} | | 2.7 | | 18 | V |
| Output Voltage | | 0.992 | 1.0 | 1.008 | V |
| Default Switching Frequency | | 1.93 | 2.0 | 2.07 | MHz |
| Maximum Output Current | Derating is Necessary for Certain V _{IN} and Thermal Conditions | 4 | | | |
| Efficiency | V _{IN} = 12V | | | | |
| | f _{SW} = 2MHz | | 78 | | % |
| | $V_{OUT} = 1.0V$ at $I_{OUT} = 4A$ | | | | |

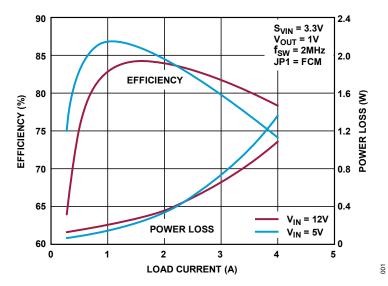


Figure 1. LT8624S Demo Circuit EVAL-LT8624S-AZ Efficiency vs. Load Current (Input from V_{IN} Terminal)

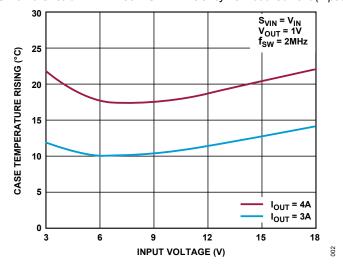


Figure 2. Temperature Rising vs. V_{IN}

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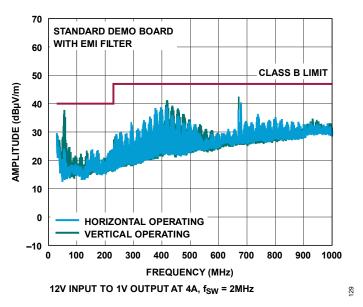


Figure 3. LT8624S Demo Circuit EVAL-LT8624S-AZ EMI Performance (12V Input to 1.0V Output at 4.A, f_{SW} = 2MHz)

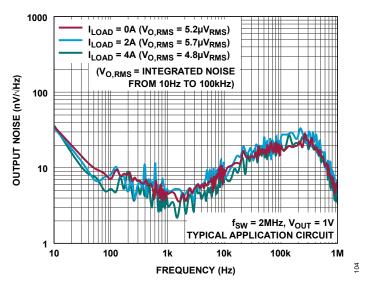


Figure 4. LT8624S Data Sheet Typical Application Circuit Noise Spectral Density (12V Input to 1.0V Output, f_{SW} = 2MHz)

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Quick Start Procedure

The demonstration circuit EVAL-LT8624S-AZ is easy to set up to evaluate the performance of LT8624S. See Figure 5 for proper equipment setup and follow these test procedures.

NOTE: When measuring the input or output voltage ripple, be careful to avoid a long ground lead on the oscilloscope probe. Measure the output voltage ripple by touching the probe tip directly across the output capacitor. For input voltage ripple and remote output voltage ripple, measure them through the SMA connectors through VIN_SENSE and Vo_sense. Figure 6 shows the output voltage ripple measured at the output capacitor C20 through the V_{O_SENSE} SMA connector.

- 1. Place JP1 on the FCM position.
- 2. With power off, connect the input power supply to V_{IN} (E1) and GND (E2).
- 3. With power off, connect the load from V_{OUT} (E19) to GND (E20).

- Connect the DMM between the input test points: V_{IN_SENSE} (E3) and SENSE_GND (E4) to monitor the input voltage. Connect DMM between V_{O_SENSE} (E10) and SENSE_GND (E11) to monitor the output voltage.
- 5. Turn on the power supply at the input.
- 6. Check for the proper output voltage ($V_{OUT} = 1V$).
- 7. Once the input and output voltages are properly established, adjust the load current within the operating range of 0A to 4A maximum per channel. Observe the output voltage regulation, output voltage ripples, switching node waveform, load transient response, and other parameters.
- Add an external clock to the SYNC terminal when using the SYNC function (JP1 on the SYNC position). Choose the RT resistor (R4) to set the LT8624S switching frequency at least 20% below the lowest SYNC frequency.

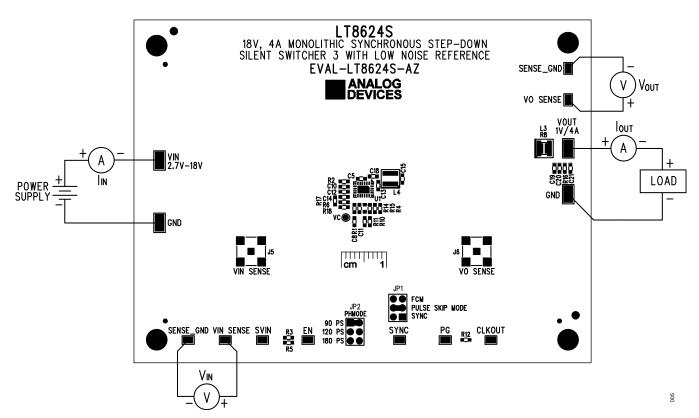


Figure 5. Proper Measurement Equipment Setup

Typical Performance Characteristics

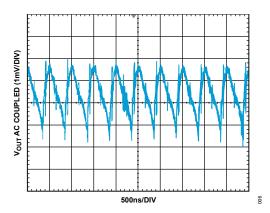


Figure 6. LT8624S Demo Circuit EVAL-LT8624S-AZ Output Voltage Ripple Measured Through J6
(12V Input, Remote Sense enabled, I_{OUT} = 4A, 200MHz BW)

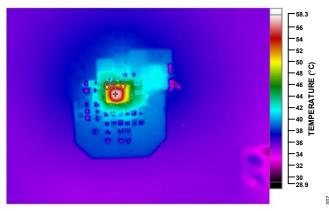


Figure 7. Thermal Performance at V_{IN} = 12V, S_{VIN} = V_{IN} , f_{SW} = 2MHz, V_{OUT} = 1.0V, I_{LOAD} = 4A, T_A = 25°C

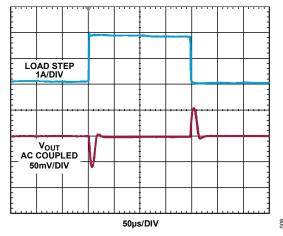


Figure 8. Transient Response with Load Steps 0A to 2A to 0A at dl/dt = $2A/\mu s$. V_{OUT} measured at C21.

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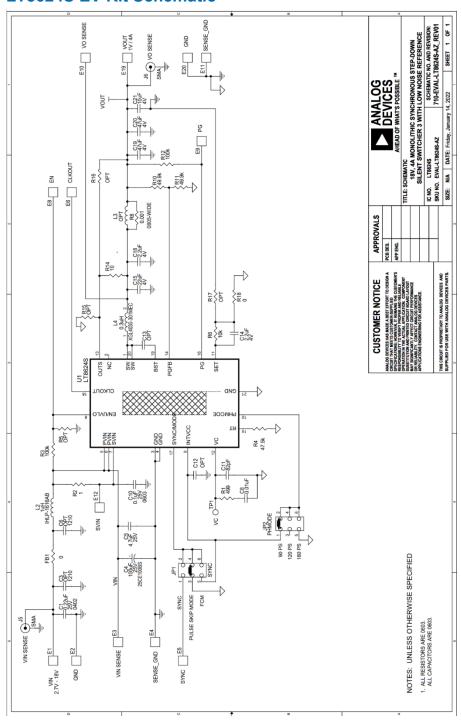
LT8624S EV Kit Bill of Materials

| 1 | ITEM | QTY | REFERENCE | PART DESCRIPTION | MANUFACTURER/PART NUMBER |
|---|------|-----|-------------------|---|--------------------------------|
| 1 | | | | REQUIRED CIRCUIT COMPONENTS | |
| 1 | | 1 | C1 | CAP.,0.22µF, X7R, 25V, 10%, 0402 | TDK, CGA2B3X7R1E224K050BB |
| | 2 | 0 | C3, C6 | CAP., OPTION, 1210 | |
| 1 | 3 | 1 | C4 | CAP.,100µF,ALUM ELECT, 25V, 20%, | SUN ELECTRONIC INDUSTRIES |
| 5 1 C8 CAP, 0.01μF, X7R, 50V, 10%, 0603 AVX, 06035C103KAT2A 7 1 C10 CAP, 0.1μF, X7R, 25V, 10%, 0603 AVX, 06035C103KAT2A 7 1 C11 CAP, 0.91μF, X7R, 25V, 10%, 0603 AVX, 06033C104KAT2A 8 0 C12, C13 CAP, 0.9710N, 0603 AVX, 06033C104KAT2A 9 2 C14, C18 CAP, 2.2μF, X7R, 63V, 10%, 0603, AEC- Q200 MURATA, GCM18BR70J22SKE22J 10 1 C15 CAP, 2.2μF, X7R, 4V, 20%, 0603 MURATA, GCM18BR70J22SKE22J 11 2 C19, C20 CAP, 2.2μF, X7R, 4V, 20%, 0603 MURATA, GCM18BR80G476ME15D 12 1 C21 CAP, 10μF, X7S, 4V, 20%, 0603 MURATA, GRM18BR80G476ME15D 13 4 E1, E2, E19, E20 TEST POINT, SILVER PLATE, PHOSPHOR BRONZE, 3.81mm x 2.03mm, 2.29mm H, SMT TECONNECTIVITY, 1625854-2 14 11 E3-E6, E8-E12 TEST POINT, 0805, 2mm x 1.25mm x 1, 25mm x 1, 25mm x 1, 45mm, PROBE PAD, FOIL, VERT, SMT, NATURAL WURTH ELEKTRONIK, 885012206006 14 11 E3-E6, E8-E12 TEST POINT, 0805, 2mm x 1.25mm x 1, 25mm x 1, 25m | | | | 6.3mm x 7.7mm, CE-BS Series | CORP, 25CE100BS |
| 6 1 C10 CAP., 0.1µF, XTR, 25V, 10%, 0603 AVX, 06035C103KATZA 7 1 C11 CAP., 82pF, XTR, 50V, 10%, 0603 AVX, 06033C104KATZA 8 0 C12, C13 CAP., 0PTION, 0603 AVX, 06033C104KATZA 9 2 C14, C18 CAP., 22µF, XTR, 6.3V, 10%, 0603, AEC- Q200 MURATA, GCM188R70J225KE2J, Q200 10 1 C15 CAP., 22µF, XTR, 4V, 20%, 0603 YAGEO, CC0805KKXTRSB8225 11 2 C19, C20 CAP., 41µF, X5R, 4V, 20%, 0603 TMATA, GRM188R80G470ME15D 12 1 C21 CAP., 21µF, X75R, 4V, 20%, 0603 TDK, C1608X750G106M800AB 13 4 E1, E2, E19, E20 TEST POINT, SILVER PLATE, PHOSPHOR BRONGS, 22mm x 1, 25mm x TE CONNECTIVITY, 1625854-2 14 11 E3-E6, E8-E12 TEST POINT, 0805, 2mm x 1, 25mm x WURTH ELEKTRONIK, 885012206006 15 2 FB1, R18 RES., 00, 1/10W, 0603, AEC-Q200 VISHAY, CRCW0603000020EA 16 2 J5, J6 CONN., RP/COAX, SMA JACK, FEMALE, 1 WURTH ELEKTRONIK, 885012206006 17 2 JP1, JP2 CONN. | 4 | 1 | C5 | CAP., 4.7µF, X5R, 25V, 10%, 0603 | MURATA, GRM188R61E475KE15D |
| 7 1 C11 CAP., 82pF, X7R, 50V, 10%, 0603 AVX, 06033C104KAT2A 8 0 CC12, C13 CAP., OPTION, 0803 9 2 C14, C18 CAP., 22pF, X7R, 63V, 10%, 0603, AEC-Q200 MURATA, GCM188R70J225KE22J 10 1 C15 CAP., 22pF, X7R, 63V, 10%, 0603 YAGEO, CC0805KKX7R5B8225 11 2 C19, C20 CAP., 47pF, X5R, 4V, 20%, 0603 MURATA, GRM188R60G476ME15D 12 1 C21 CAP., 10pF, X7S, 4V, 20%, 0603 MURATA, GRM188R60G476ME15D 12 1 C21 CAP., 10pF, X7S, 4V, 20%, 0603 MURATA, GRM188R60G476ME15D 12 1 C21 CAP., 10pF, X7S, 4V, 20%, 0603 TDK, C1608X7S0G106M0800AB 13 4 E1, E2, E19, E20 TEST POINT, SILVER PLATE, PHOSPHOR BRONZE, 38 mm x 2,03mm, 2.29mm H, SMT TE CONNECTIVITY, 1625854-2 14 11 E3 -E6, E8-E12 TEST POINT, 0805, 2mm x 1,25mm x WURTH ELEKTRONIK, 885012206006 15 2 FB1, R18 RES.,00, 110W, 0603, AEC-Q200 VISHAY, CRCW0603000020EA 16 2 J5, J6 CONN, RPICOAX, SMA JACK, FEMALE, 1 | | 1 | C8 | CAP., 0.01µF, X7R, 50V, 10%, 0603 | |
| 8 0 C12, C13 CAP., OPTION, 0603 MURATA, GCM18BR70J225KE22J 9 2 C14, C18 CAP., 22µF, X7R, 6.9X, 10%, 0603, AEC-Q20 MURATA, GCM18BR70J225KE22J 10 1 C15 CAP., 22µF, X7R, 4V, 20%, 0603 YAGEO, CC0805KXX7R5B8225 11 2 C19, C20 CAP., 47µF, X5R, 4V, 20%, 0603 MURATA, GRM18BR60G478ME15D 12 1 C21 CAP., 10µF, X7S, 4V, 20%, 0603 TDK, C1608X7S0G106M080AB 13 4 E1, E2, E19, E20 TEST POINT, SILVER PLATE, PHOSPHOR BRONZE, 381mm x 203mm, 229mm H, SMT TE CONNECTIVITY, 1625854-2 14 11 E3-E6, E8-E12 TEST POINT, 0805, 2mm x 1.25mm x WURTH ELEKTRONIK, 885012206006 15 2 FB1, R18 RES.,00, 110W, 0603, AEC-Q200 VISHAY, CRCW06030000Z0EA 16 2 J5, J6 CONN, RPICOAX, SMA JACK, FEMALE, 1 MOLEX, 0732511350 17 2 JP1, JP2 CONN, HDR, MALE, 2mm x 3,2mm, VERT, SMT, 500, Au WURTH ELEKTRONIK, 62000621121 18 1 L2 IND., 1µH, PWR, SHIELDED, 20%, 4A, 52,5mQ, 1616AB, IHLP-01 Series VISHAY, IHLP1616ABER1ROM01 19< | 6 | 1 | C10 | CAP., 0.1µF, X7R, 25V, 10%, 0603 | AVX, 06035C103KAT2A |
| 9 2 C14, C18 CAP., 2.2μF, X7R, 6.3V, 10%, 0603, AEC-Q200 MURATA, GCM188R70J225KE22J Q200 10 1 C15 CAP., 22μF, X7R, 4V, 20%, 0603 YAGEO, CC0805KKX7R5BB225 11 2 C19, C20 CAP., 47μF, X5R, 4V, 20%, 0603 MURATA, GRM188R60G478ME15D 12 1 C21 CAP., 10μF, X7S, 4V, 20%, 0603 TDK, C1608X7S0G106M080AB 13 4 E1, E2, E19, E20 TEST POINT, SILVER PLATE, PHOSPHOR BRONZE, 3.81mm x 2.03mm, 2.29mm H, SMT TE CONNECTIVITY, 1625854-2 14 11 E3-E6, E8-E12 TEST POINT, 0805, 2mm x 1.25mm x 1.25mm x 1.45mm, PROBE PAD, FOIL, VERT, SMT, NATURAL WURTH ELEKTRONIK, 885012206006 15 2 FB1, R18 RES., 00, 1/10W, 0603, AEC-Q200 VISHAY, CRCW06030000Z0EA 16 2 J5, J6 CONN., RFICOAX, SMA JACK, FEMALE, 1 PORT, VERT, ST, SMT, 500, AU WURTH ELEKTRONIK, 62000621121 17 2 JP1, JP2 CONN., HDR, MALE, 2mm x 3.2mm, VERT, SMT, SMT, SMT, SMT, SMT, SMT, SMT, SM | 7 | 1 | C11 | CAP., 82pF, X7R, 50V, 10%, 0603 | AVX, 06033C104KAT2A |
| Q200 | 8 | 0 | C12, C13 | CAP., OPTION, 0603 | |
| 10 1 C15 CAP., 22μF, X7R, 4V, 20%, 0603 YAGEO, CC0805KKX7R5B8225 11 2 C19, C20 CAP., 47μF, X5R, 4V, 20%, 0603 MURATA, GRM188R60G476ME15D 12 1 C21 CAP., 10μF, X7S, 4V, 20%, 0603 TDK, C1608X7S0G106M080AB 13 4 E1, E2, E19, E20 TEST POINT, SILVER PLATE, PHOSPHOR BRONZE, 3.81mm x 2.03mm, 2.29mm H, SMT TECONNECTIVITY, 1625854-2 14 11 E3-E6, E8-E12 TEST POINT, 0805, 2mm x 1.25mm x MWRTH ELEKTRONIK, 885012206006 15 2 FB1, R18 RES., 00, 110W, 0603, AEC-Q200 VISHAY, CRCW06030000Z0EA 16 2 J5, J6 CONN., RF/COAX, SMA JACK, FEMALE, 1 MOLEX, 0732511350 17 2 JP1, JP2 CONN., RF/COAX, SMA JACK, FEMALE, 1 WURTH ELEKTRONIK, 62000621121 18 1 L2 INDR., 1μH, PWR, SHIELDED, 20%, 4A, 52.5m0, 4A, 52.5m0, 1616AB, IHLP-01 Series VISHAY, IHLP1616ABER1R0M01 19 1 L4 IND., 0.3μH, PWR, 20%, 21.2A, 3.4m0, SMA, ABC, 4A, 52.5m0, 1616AB, IHLP-01 Series COILCRAFT, XGL4030-301MEC 20 1 LB1 LBEL SPEC, DEMO BOARD SERIAL NUMBER BRADY, THT-96-717-10 </td <td>9</td> <td>2</td> <td>C14, C18</td> <td>CAP., 2.2µF, X7R, 6.3V, 10%, 0603, AEC-</td> <td>MURATA, GCM188R70J225KE22J</td> | 9 | 2 | C14, C18 | CAP., 2.2µF, X7R, 6.3V, 10%, 0603, AEC- | MURATA, GCM188R70J225KE22J |
| 11 2 C19, C20 CAP., 47μF, X5R, 4V, 20%, 0603 MURATA, GRM188R60G476ME15D 12 1 C21 CAP., 10μF, X7S, 4V, 20%, 0603 TDK, C1608X750G106M080AB 13 4 E1, E2, E19, E20 TEST POINT, SILVER PLATE, PHOSPHOR BRONZE, 3.81mm x 2.03mm, 2.29mm H, SMT TE CONNECTIVITY, 1625854-2 14 11 E3-E6, E8-E12 TEST POINT, 0805, 2mm x 1.25mm x 1.45mm x 1.45mm, PROBE PAD, FOIL, VERT, SMT, NATURAL WURTH ELEKTRONIK, 885012206006 15 2 FB1, R18 RES., 0Ω, 1/10W, 0603, AEC-Q200 VISHAY, CRCW06030000Z0EA 16 2 J5, J6 CONN., RFICOAX, SMA JACK, FEMALE, 1 PORT, VERT, ST, SMT, 50Q, Au MOLEX, 0732511350 17 2 JP1, JP2 CONN., HDR, MALE, 2mm x 3,2mm, VERT, ST, THT WURTH ELEKTRONIK, 62000621121 18 1 L2 IND., 19H, PWR, SHIELDED, 20%, 4A, S2,5mQ, 1616AB, IHLP-01 Series VISHAY, IHLP1616ABER1R0M01 19 1 L4 IND., 39H, PWR,20%, 21.2A, 3.4mQ, SMELDED COILCRAFT, XGL4030-301MEC 20 1 LB1 LABEL SPEC, DEMO BOARD SERIAL NUMBER BRADY, THT-96-717-10 NUMBER 21 4 MP1-MP4 STANDOFF, NYLON | | | | Q200 | |
| 1 | 10 | 1 | C15 | CAP., 22µF, X7R, 4V, 20%, 0603 | YAGEO, CC0805KKX7R5BB225 |
| 13 | 11 | 2 | C19, C20 | CAP., 47µF, X5R, 4V, 20%, 0603 | MURATA, GRM188R60G476ME15D |
| BRONZE, 3.81mm x 2.03mm, 2.29mm H, SMT | 12 | 1 | C21 | CAP., 10µF, X7S, 4V, 20%, 0603 | TDK, C1608X7S0G106M080AB |
| SMT | 13 | 4 | E1, E2, E19, E20 | TEST POINT, SILVER PLATE, PHOSPHOR | TE CONNECTIVITY, 1625854-2 |
| 14 11 E3-E6, E8-E12 TEST POINT, 0805, 2mm x 1.25mm x 1.45mm x 1.45mm, PROBE PAD, FOIL, VERT, SMT, NATURAL WURTH ELEKTRONIK, 885012206006 15 2 FB1, R18 RES.,0Ω, 1/10W, 0603, AEC-Q200 VISHAY, CRCW06030000Z0EA 16 2 J5, J6 CONN., RF/COAX, SMA JACK, FEMALE, 1 PORT, VERT, ST, SMT, 50Ω, Au MOLEX, 0732511350 17 2 JP1, JP2 CONN., HDR, MALE, 2mm x 3,2mm, VERT, ST, THT WURTH ELEKTRONIK, 62000621121 18 1 L2 IND.,1µH, PWR, SHIELDED, 20%, 4A, S.5.mQ, 1616AB, IHLP-01 Series VISHAY, IHLP1616ABER1R0M01 19 1 L4 IND.,0 3µH, PWR,20%, 21, 2A, 3.4mQ, SMD, AEC-Q200, SHIELDED COILCRAFT, XGL4030-301MEC 20 1 LB1 LABEL SPEC, DEMO BOARD SERIAL NUMBER BRADY, THT-96-717-10 NUMBER 21 4 MP1-MP4 STANDOFF, NYLON, SNAPON, SN | | | | BRONZE, 3.81mm x 2.03mm, 2.29mm H, | |
| 1.45mm, PROBE PAD, FOIL, VERT, SMT, NATURAL RES.,0Ω, 1/10W, 0603, AEC-Q200 VISHAY, CRCW06030000Z0EA 15 2 FB1, R18 RES.,0Ω, 1/10W, 0603, AEC-Q200 VISHAY, CRCW06030000Z0EA 16 2 J5, J6 CONN., RF/COAX, SMA JACK, FEMALE, 1 PORT, VERT, ST, SMT, 50Ω, Au 17 2 JP1, JP2 CONN., HDR, MALE, 2mm x 3,2mm, VERT, ST, THT WURTH ELEKTRONIK, 62000621121 18 1 L2 IND.,1μH, PWR, SHIELDED, 20%, 4A, 52.5mΩ,1616AB, IHLP-01 Series IND.,0.3μH, PWR,20%, 21.2A, 3.4mΩ, COILCRAFT, XGL4030-301MEC SMD, AEC-Q200, SHIELDED SMD, AEC-Q200, SHIELDED BRADY, THT-96-717-10 NUMBER 1 LB1 LABEL SPEC, DEMO BOARD SERIAL BRADY, THT-96-717-10 NUMBER STANDOFF, NYLON, SNAPON, 0.375" KEYSTONE, 8832 0.375" ADI APPROVED SUPPLIER, 600-EVAL-L18624S-AZ ADI APPROVED SUPPLIER, 600-EVAL-L18624S-AZ VISHAY, CRCW0603499RFKEA 1 R1 RES., 499Ω, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW0603100KFKEA 1 R2 RES.,10, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW0603100KFKEA 1 R4 RES.,47.5kΩ, 1%, 1/10W, 0603 VISHAY, CRCW060310KFKEA 1 R6 RES., 00, 3/4W, 1206, PULSE PROOF, VISHAY, CRCW12060000Z0EAHP HIGH PWR, AEC-Q200 VISHAY, CRCW120600 | | | | SMT | |
| NATURAL NATURAL | 14 | 11 | E3-E6, E8-E12 | TEST POINT, 0805, 2mm x 1.25mm x | WURTH ELEKTRONIK, 885012206006 |
| 15 2 FB1, R18 RES., 0Ω, 1/10W, 0603, AEC-Q200 VISHAY, CRCW06030000Z0EA 16 2 J5, J6 CONN., RF/COAX, SMA JACK, FEMALE, 1 PORT, VERT, ST, SMT, 50Ω, Au MOLEX, 0732511350 17 2 JP1, JP2 CONN., HDR, MALE, 2mm x 3,2mm, VERT, ST, THT WURTH ELEKTRONIK, 62000621121 18 1 L2 IND., 1µH, PWR, SHIELDED, 20%, 4A, 52.5mΩ, 1616AB, IHLP-01 Series VISHAY, IHLP1616ABER1R0M01 19 1 L4 IND., 0.3µH, PWR, 20%, 21.2A, 3.4mΩ, SMD, AEC-Q200, SHIELDED COILCRAFT, XGL4030-301MEC 20 1 LB1 LABEL SPEC, DEMO BOARD SERIAL NUMBER BRADY, THT-96-717-10 21 4 MP1-MP4 STANDOFF, NYLON, SNAPON, 0.375" KEYSTONE, 8832 22 1 PCB1 PCB, EVAL-LT8624S-AZ ADI APPROVED SUPPLIER, 600- EVAL-LT8624S-AZ 23 1 R1 RES., 499Ω, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW0603499RFKEA 24 1 R2 RES., 100kΩ, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW0603100KFKEA 26 1 R4 RES., 47.5kΩ, 1%, 1/10W, 0603 VISHAY, CRCW0603100KFKEA 27 <td< td=""><td></td><td></td><td></td><td>1.45mm, PROBE PAD, FOIL, VERT, SMT,</td><td></td></td<> | | | | 1.45mm, PROBE PAD, FOIL, VERT, SMT, | |
| 16 2 J5, J6 CONN., RF/COAX, SMA JACK, FEMALE, 1 PORT, VERT, ST, SMT, 50Ω, Au MOLEX, 0732511350 17 2 JP1, JP2 CONN., HDR, MALE, 2mm x 3,2mm, VERT, ST, THT WURTH ELEKTRONIK, 62000621121 18 1 L2 IND.,1μH, PWR, SHIELDED, 20%, 4A, 52.5mΩ, 1616AB, IHLP-01 Series VISHAY, IHLP1616ABER1R0M01 19 1 L4 IND.,0.3μH, PWR,20%, 21.2A, 3.4mΩ, 21.2A, 3.4mΩ, MAEC-Q200, SHIELDED COILCRAFT, XGL4030-301MEC 20 1 LB1 LABEL SPEC, DEMO BOARD SERIAL NUMBER BRADY, THT-96-717-10 21 4 MP1-MP4 STANDOFF, NYLON, SNAPON, 0.375° KEYSTONE, 8832 22 1 PCB1 PCB, EVAL-LT8624S-AZ ADI APPROVED SUPPLIER, 600-EVAL-LT8624S-AZ 23 1 R1 RES., 499Ω, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW0603499RFKEA 24 1 R2 RES.,1Ω, 1%, 1/10W, 0603, AEC-Q200 NIC, NRC06F1R00TRF 25 2 R3, R12 RES.,10kΩ, 1%, 1/10W, 0603 VISHAY, CRCW060310KFKEA 26 1 R4 RES.,47.5kΩ, 1%, 1/10W, 0603 VISHAY, CRCW060310K0FKEA 27 0 | | | | NATURAL | |
| PORT, VERT, ST, SMT, 50Ω, Au PORT, VERT, ST, SMT, 50Ω, Au CONN., HDR, MALE, 2mm x 3,2mm, VERT, ST, THT WURTH ELEKTRONIK, 62000621121 ST, THT IND., 1μH, PWR, SHIELDED, 20%, 4A, 52.5mΩ, 1616AB, IHLP-01 Series VISHAY, IHLP1616ABER1R0M01 S2.5mΩ, 1616AB, IHLP-01 Series COILCRAFT, XGL4030-301MEC SMD, AEC-Q200, SHIELDED BRADY, THT-96-717-10 SMD, AEC-Q200, SHIELDED BRADY, THT-96-717-10 NUMBER BRADY, THT-96-717-10 NUMBER STANDOFF, NYLON, SNAPON, KEYSTONE, 8832 O.375" ADI APPROVED SUPPLIER, 600-EVAL-LT8624S-AZ ADI APPROVED SUPPLIER, 600-EVAL-LT8624S-AZ ADI APPROVED SUPPLIER, 600-EVAL-LT8624S-AZ ADI APPROVED SUPPLIER, 600-EVAL-LT8624S-AZ SMD, AEC-Q200 VISHAY, CRCW0603499RFKEA ADI APPROVED SUPPLIER, 600-EVAL-LT8624S-AZ ADI APPROVED SUPPLIER, 600-EVAL-LT8624S-AZ SMD, AEC-Q200 VISHAY, CRCW0603499RFKEA ADI APPROVED SUPPLIER, 600-EVAL-LT8624S-AZ ADI APPROVED SUPPL | 15 | 2 | FB1, R18 | RES.,0Ω, 1/10W, 0603, AEC-Q200 | VISHAY, CRCW06030000Z0EA |
| 17 2 JP1, JP2 CONN., HDR, MALE, 2mm x 3,2mm, VERT, ST, THT WURTH ELEKTRONIK, 62000621121 18 1 L2 IND.,1µH, PWR, SHIELDED, 20%, 4A, 52.5mΩ, 1616AB, IHLP-01 Series VISHAY, IHLP1616ABER1R0M01 19 1 L4 IND.,0.3µH, PWR,20%, 21.2A, 3.4mΩ, SMD, AEC-Q200, SHIELDED COILCRAFT, XGL4030-301MEC 20 1 LB1 LABEL SPEC, DEMO BOARD SERIAL NUMBER BRADY, THT-96-717-10 21 4 MP1-MP4 STANDOFF, NYLON, SNAPON, 0.375" KEYSTONE, 8832 22 1 PCB1 PCB, EVAL-LT8624S-AZ ADI APPROVED SUPPLIER, 600-EVAL-LT8624S-AZ 23 1 R1 RES., 499Ω, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW0603499RFKEA 24 1 R2 RES.,1Ω, 1%, 1/10W, 0603, AEC-Q200 NIC, NRC06F1R00TRF 25 2 R3, R12 RES.,100kΩ, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW060310KFKEA 26 1 R4 RES.,47.5kΩ, 1%, 1/10W, 0603 VISHAY, CRCW060347K5FKEA 27 0 R5, R15, R16, R17 RES., 0PTION, 0603 VISHAY, CRCW060310K0FKEA 29 1 R8 <td< td=""><td>16</td><td>2</td><td>J5, J6</td><td>CONN., RF/COAX, SMA JACK, FEMALE, 1</td><td>MOLEX, 0732511350</td></td<> | 16 | 2 | J5, J6 | CONN., RF/COAX, SMA JACK, FEMALE, 1 | MOLEX, 0732511350 |
| ST, THT | | | | PORT, VERT, ST, SMT, 50Ω, Au | |
| 18 1 L2 IND., 1μH, PWR, SHIELDED, 20%, 4A, 52.5mΩ,1616AB, IHLP-01 Series VISHAY, IHLP1616ABER1R0M01 19 1 L4 IND., 0.3μH, PWR, 20%, 21.2A, 3.4mΩ, SMD, AEC-Q200, SHIELDED COILCRAFT, XGL4030-301MEC 20 1 LB1 LABEL SPEC, DEMO BOARD SERIAL NUMBER BRADY, THT-96-717-10 21 4 MP1-MP4 STANDOFF, NYLON, SNAPON, 0.375" KEYSTONE, 8832 22 1 PCB1 PCB, EVAL-LT8624S-AZ ADI APPROVED SUPPLIER, 600-EVAL-LT8624S-AZ 23 1 R1 RES., 499Ω, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW0603499RFKEA 24 1 R2 RES.,10, 1%, 1/10W, 0603, AEC-Q200 NIC, NRC06F1R00TRF 25 2 R3, R12 RES.,100kΩ, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW0603100KFKEA 26 1 R4 RES.,47.5kΩ, 1%, 1/10W, 0603 VISHAY, CRCW060347K5FKEA 27 0 R5, R15, R16, R17 RES., 0PTION, 0603 VISHAY, CRCW060310K0FKEA 29 1 R8 RES., 0Ω, 3/4W, 1206, PULSE PROOF, HIGH PWR, AEC-Q200 VISHAY, CRCW12060000Z0EAHP | 17 | 2 | JP1, JP2 | CONN., HDR, MALE, 2mm x 3,2mm, VERT, | WURTH ELEKTRONIK, 62000621121 |
| 52.5mΩ,1616AB, IHLP-01 Series 19 | | | | ST, THT | |
| 19 1 L4 IND.,0.3μH, PWR,20%, 21.2A, 3.4mΩ, SMD, AEC-Q200, SHIELDED COILCRAFT, XGL4030-301MEC 20 1 LB1 LABEL SPEC, DEMO BOARD SERIAL NUMBER BRADY, THT-96-717-10 21 4 MP1-MP4 STANDOFF, NYLON, SNAPON, 0.375" KEYSTONE, 8832 22 1 PCB1 PCB, EVAL-LT8624S-AZ ADI APPROVED SUPPLIER, 600-EVAL-LT8624S-AZ 23 1 R1 RES., 499Ω, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW0603499RFKEA 24 1 R2 RES.,1Ω, 1%, 1/10W, 0603, AEC-Q200 NIC, NRC06F1R00TRF 25 2 R3, R12 RES.,100kΩ, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW0603100KFKEA 26 1 R4 RES.,47.5kΩ, 1%, 1/10W, 0603 VISHAY, CRCW060347K5FKEA 27 0 R5, R15, R16, R17 RES., OPTION, 0603 VISHAY, CRCW060310K0FKEA 29 1 R8 RES., 0Ω, 3/4W, 1206, PULSE PROOF, HIGH PWR, AEC-Q200 VISHAY, CRCW12060000Z0EAHP | 18 | 1 | L2 | IND.,1µH, PWR, SHIELDED, 20%, 4A, | VISHAY, IHLP1616ABER1R0M01 |
| SMD, AEC-Q200, SHIELDED | | | | | |
| 20 1 LB1 LABEL SPEC, DEMO BOARD SERIAL NUMBER BRADY, THT-96-717-10 21 4 MP1-MP4 STANDOFF, NYLON, SNAPON, 0.375" KEYSTONE, 8832 22 1 PCB1 PCB, EVAL-LT8624S-AZ ADI APPROVED SUPPLIER, 600-EVAL-LT8624S-AZ 23 1 R1 RES., 499Ω, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW0603499RFKEA 24 1 R2 RES.,1Ω, 1%, 1/10W, 0603, AEC-Q200 NIC, NRC06F1R00TRF 25 2 R3, R12 RES.,100kΩ, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW0603100KFKEA 26 1 R4 RES.,47.5kΩ, 1%, 1/10W, 0603 VISHAY, CRCW060347K5FKEA 27 0 R5, R15, R16, R17 RES., OPTION, 0603 28 1 R6 RES., 10kΩ, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW060310K0FKEA 29 1 R8 RES., 0Ω, 3/4W, 1206, PULSE PROOF, HIGH PWR, AEC-Q200 VISHAY, CRCW12060000Z0EAHP | 19 | 1 | L4 | IND.,0.3μH, PWR,20%, 21.2A, 3.4mΩ, | COILCRAFT, XGL4030-301MEC |
| NUMBER NUMBER 21 4 MP1-MP4 STANDOFF, NYLON, SNAPON, 0.375" KEYSTONE, 8832 22 1 PCB1 PCB, EVAL-LT8624S-AZ ADI APPROVED SUPPLIER, 600-EVAL-LT8624S-AZ 23 1 R1 RES., 499Ω, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW0603499RFKEA 24 1 R2 RES., 1Ω, 1%, 1/10W, 0603, AEC-Q200 NIC, NRC06F1R00TRF 25 2 R3, R12 RES., 100kΩ, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW0603100KFKEA 26 1 R4 RES., 47.5kΩ, 1%, 1/10W, 0603 VISHAY, CRCW060347K5FKEA 27 0 R5, R15, R16, R17 RES., OPTION, 0603 VISHAY, CRCW060310K0FKEA 29 1 R8 RES., 0Ω, 3/4W, 1206, PULSE PROOF, HIGH PWR, AEC-Q200 VISHAY, CRCW12060000Z0EAHP | | | | SMD, AEC-Q200, SHIELDED | |
| 21 4 MP1-MP4 STANDOFF, NYLON, SNAPON, 0.375" KEYSTONE, 8832 22 1 PCB1 PCB, EVAL-LT8624S-AZ ADI APPROVED SUPPLIER, 600-EVAL-LT8624S-AZ 23 1 R1 RES., 499Ω, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW0603499RFKEA 24 1 R2 RES.,1Ω, 1%, 1/10W, 0603, AEC-Q200 NIC, NRC06F1R00TRF 25 2 R3, R12 RES.,100kΩ, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW0603100KFKEA 26 1 R4 RES.,47.5kΩ, 1%, 1/10W, 0603 VISHAY, CRCW060347K5FKEA 27 0 R5, R15, R16, R17 RES., OPTION, 0603 28 1 R6 RES., 10kΩ, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW060310K0FKEA 29 1 R8 RES., 0Ω, 3/4W, 1206, PULSE PROOF, HIGH PWR, AEC-Q200 VISHAY, CRCW12060000Z0EAHP | 20 | 1 | LB1 | LABEL SPEC, DEMO BOARD SERIAL | BRADY, THT-96-717-10 |
| 0.375" | | | | | |
| 22 1 PCB1 PCB, EVAL-LT8624S-AZ ADI APPROVED SUPPLIER, 600-EVAL-LT8624S-AZ 23 1 R1 RES., 499Ω, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW0603499RFKEA 24 1 R2 RES.,1Ω, 1%, 1/10W, 0603, AEC-Q200 NIC, NRC06F1R00TRF 25 2 R3, R12 RES.,100kΩ, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW0603100KFKEA 26 1 R4 RES.,47.5kΩ, 1%, 1/10W, 0603 VISHAY, CRCW060347K5FKEA 27 0 R5, R15, R16, R17 RES., OPTION, 0603 28 1 R6 RES., 10kΩ, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW060310K0FKEA 29 1 R8 RES., 0Ω, 3/4W, 1206, PULSE PROOF, HIGH PWR, AEC-Q200 VISHAY, CRCW12060000Z0EAHP | 21 | 4 | MP1-MP4 | STANDOFF, NYLON, SNAPON, | KEYSTONE, 8832 |
| EVAL-LT8624S-AZ RES., 499Ω, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW0603499RFKEA RES., 1Ω, 1%, 1/10W, 0603, AEC-Q200 NIC, NRC06F1R00TRF RES., 100kΩ, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW0603100KFKEA RES., 47.5kΩ, 1%, 1/10W, 0603 VISHAY, CRCW060347K5FKEA RES., 47.5kΩ, 1%, 1/10W, 0603 VISHAY, CRCW060347K5FKEA RES., 0PTION, 0603 RES., 10kΩ, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW060310K0FKEA RES., 10kΩ, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW060310K0FKEA RES., 10kΩ, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW060310K0FKEA RES., 0Ω, 3/4W, 1206, PULSE PROOF, HIGH PWR, AEC-Q200 | | | | | |
| 23 1 R1 RES., 499Ω, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW0603499RFKEA 24 1 R2 RES.,1Ω, 1%, 1/10W, 0603, AEC-Q200 NIC, NRC06F1R00TRF 25 2 R3, R12 RES.,100kΩ, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW0603100KFKEA 26 1 R4 RES.,47.5kΩ, 1%, 1/10W, 0603 VISHAY, CRCW060347K5FKEA 27 0 R5, R15, R16, R17 RES., OPTION, 0603 28 1 R6 RES., 10kΩ, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW060310K0FKEA 29 1 R8 RES., 0Ω, 3/4W, 1206, PULSE PROOF, HIGH PWR, AEC-Q200 VISHAY, CRCW12060000Z0EAHP | 22 | 1 | PCB1 | PCB, EVAL-LT8624S-AZ | ADI APPROVED SUPPLIER, 600- |
| 24 1 R2 RES.,1Ω, 1%, 1/10W, 0603, AEC-Q200 NIC, NRC06F1R00TRF 25 2 R3, R12 RES.,100kΩ, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW0603100KFKEA 26 1 R4 RES.,47.5kΩ, 1%, 1/10W, 0603 VISHAY, CRCW060347K5FKEA 27 0 R5, R15, R16, R17 RES., OPTION, 0603 28 1 R6 RES., 10kΩ, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW060310K0FKEA 29 1 R8 RES., 0Ω, 3/4W, 1206, PULSE PROOF, HIGH PWR, AEC-Q200 VISHAY, CRCW12060000Z0EAHP | | | | | EVAL-LT8624S-AZ |
| 25 2 R3, R12 RES.,100kΩ, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW0603100KFKEA 26 1 R4 RES.,47.5kΩ, 1%, 1/10W, 0603 VISHAY, CRCW060347K5FKEA 27 0 R5, R15, R16, R17 RES., OPTION, 0603 28 1 R6 RES., 10kΩ, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW060310K0FKEA 29 1 R8 RES., 0Ω, 3/4W, 1206, PULSE PROOF, HIGH PWR, AEC-Q200 VISHAY, CRCW12060000Z0EAHP | 23 | 1 | R1 | RES., 499Ω, 1%, 1/10W, 0603, AEC-Q200 | VISHAY, CRCW0603499RFKEA |
| 25 2 R3, R12 RES.,100kΩ, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW0603100KFKEA 26 1 R4 RES.,47.5kΩ, 1%, 1/10W, 0603 VISHAY, CRCW060347K5FKEA 27 0 R5, R15, R16, R17 RES., OPTION, 0603 28 1 R6 RES., 10kΩ, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW060310K0FKEA 29 1 R8 RES., 0Ω, 3/4W, 1206, PULSE PROOF, HIGH PWR, AEC-Q200 VISHAY, CRCW12060000Z0EAHP | | | | | |
| 26 1 R4 RES.,47.5kΩ, 1%, 1/10W, 0603 VISHAY, CRCW060347K5FKEA 27 0 R5, R15, R16, R17 RES., OPTION, 0603 28 1 R6 RES., 10kΩ, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW060310K0FKEA 29 1 R8 RES., 0Ω, 3/4W, 1206, PULSE PROOF, HIGH PWR, AEC-Q200 | | | | | |
| 27 0 R5, R15, R16, R17 RES., OPTION, 0603 28 1 R6 RES., 10kΩ, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW060310K0FKEA 29 1 R8 RES., 0Ω, 3/4W, 1206, PULSE PROOF, HIGH PWR, AEC-Q200 VISHAY, CRCW12060000Z0EAHP | 25 | 2 | R3, R12 | RES.,100kΩ, 1%, 1/10W, 0603, AEC-Q200 | VISHAY, CRCW0603100KFKEA |
| 27 0 R5, R15, R16, R17 RES., OPTION, 0603 28 1 R6 RES., 10kΩ, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW060310K0FKEA 29 1 R8 RES., 0Ω, 3/4W, 1206, PULSE PROOF, HIGH PWR, AEC-Q200 VISHAY, CRCW12060000Z0EAHP | | | | | |
| 28 1 R6 RES., 10kΩ, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW060310K0FKEA 29 1 R8 RES., 0Ω, 3/4W, 1206, PULSE PROOF, HIGH PWR, AEC-Q200 VISHAY, CRCW12060000Z0EAHP | 26 | 1 | R4 | RES.,47.5kΩ, 1%, 1/10W, 0603 | VISHAY, CRCW060347K5FKEA |
| 28 1 R6 RES., 10kΩ, 1%, 1/10W, 0603, AEC-Q200 VISHAY, CRCW060310K0FKEA 29 1 R8 RES., 0Ω, 3/4W, 1206, PULSE PROOF, HIGH PWR, AEC-Q200 VISHAY, CRCW12060000Z0EAHP | | | | | |
| 29 1 R8 RES., 0Ω, 3/4W, 1206, PULSE PROOF, HIGH PWR, AEC-Q200 VISHAY, CRCW12060000Z0EAHP | | 0 | R5, R15, R16, R17 | | |
| HIGH PWR, AEC-Q200 | 28 | 1 | R6 | RES., 10kΩ, 1%, 1/10W, 0603, AEC-Q200 | VISHAY, CRCW060310K0FKEA |
| HIGH PWR, AEC-Q200 | | 1 | | | |
| | 29 | 1 | R8 | | VISHAY, CRCW12060000Z0EAHP |
| 30 2 R10, R11 RES., 49.9kΩ, 1%,1/10W, 0603 VISHAY, CRCW060349K9FKEA | | 1 | | | |
| | 30 | 2 | R10, R11 | RES., 49.9kΩ, 1%,1 /10W, 0603 | VISHAY, CRCW060349K9FKEA |

LT8624S 18V, 4A Synchronous Step-Down Silent Switcher with Ultra-Low Noise Reference

| 31 | 1 | R14 | RES.,10Ω, 1%, 1/10W, 0603 | VISHAY, CRCW06030000Z0EA |
|----|---|------------|---------------------------------|-------------------------------|
| 32 | 1 | U1 | IC, SYNC. STEP-DOWN SILENT | ANALOG DEVICES, LT8624SAV#PBF |
| | | | SWITCHER,LQFN-20 | |
| 33 | 2 | XJP1, XJP2 | CONN., SHUNT, FEMALE, 2-POS,2mm | WURTH ELEKTRONIK, 60800213421 |

LT8624S EV Kit Schematic



LT8624S 18V, 4A Synchronous Step-Down Silent Switcher with Ultra-Low Noise Reference

Revision History

| REVISION NUMBER | REVISION DATE | DESCRIPTION | PAGES CHANGED |
|--------------------|------------------|---------------------------------|------------------|
| Α | 05/24 | Initial release for open market | _ |