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Evaluates: MAX96716A, MAX96716F

MAX96716 DPHY Evaluation Kit

General Description

The MAX96716 evaluation kits (EV kits) provide a reliable platform for evaluating Maxim's devices MAX96716A, MAX96716F, through the use of standard FAKRA coaxial cables or HMTD cable. These deserializer devices support high-bandwidth, gigabit, multimedia (GMSL) serial links and offer spread spectrum and full-duplex control channel features. The EV kit includes a simple-to-use Windows 7®/Windows 10-compatible graphical user interface (GUI) for exercising device features.

In the following sections, the term deserializer refers to the MAX96716A and any of the devices listed above. The term serializer refers to any GMSL-2 serializer device, particularly the MAX96717.

For complete GMSL-2 evaluation using a standard FAKRA coax cable or HMTD cable, order the MAX96716 COAX/STP EV kit along with a companion serializer board (MAX96717 COAX/STP EV kit is referenced in this document). For a detailed look at all GMSL-2 features, including information on how to use the parts, refer to the *GMSL-2 User's Guide* (GMSL2_Users_Guide_vXX, found in Maxim's GMSL customer portal folder).

Note: Although coax cable is referenced throughout this document, the information applies equally to both coax and HMTD evaluation kits.

MAX96716 EV Kit Files

| FILE | DESCRIPTION |
|--------------------------------------|---|
| MAXSerDesEV-GMSL_VX_X_XX_Install.exe | Installs the EV kit software (GUI) onto a Windows 7/Windows 10 computer. Includes GUI user's guide, microcontroller firmware, documentation |
| MAXSerDesEV-GMSL.exe | GMSL Graphical User Interface (GUI) program |

Features

- Deserialzier Accepts GMSL2 (All Variants) Data Through Coaxial FAKRA or Differential HMTD Connectors and Converts to MIPI DPHY V1.2 Output.
- Windows 7/Windows 10-Compatible Software Support
- Powerful, Simple-to-Use GUI for Comprehensive Device Feature Evaluation
- USB-Controlled Interface (Cable Included)
- Board Powered by USB, 12V Wall Adapter, or External Power Supply
- Proven PCB Layout
- Fully Assembled and Tested

Note: EV kits are configured to use PoC and FAKRA connectors. For HMTD connector, contact factory for configuration.

[Ordering Information](#) appears at end of data sheet.

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319-101045; Rev 0, 2/24

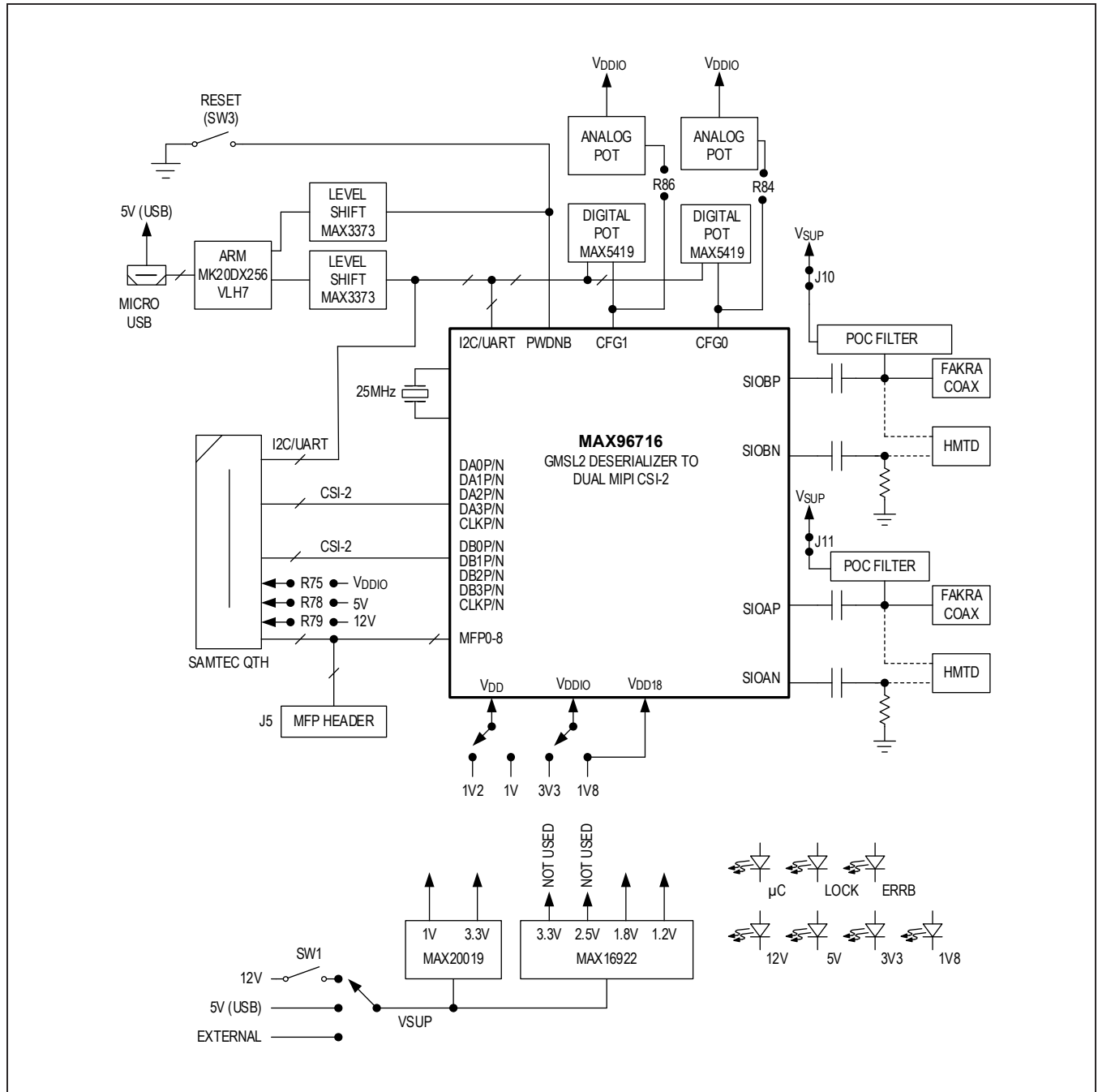


Figure 1. MAX96716 EV Kit Typical Block Diagram

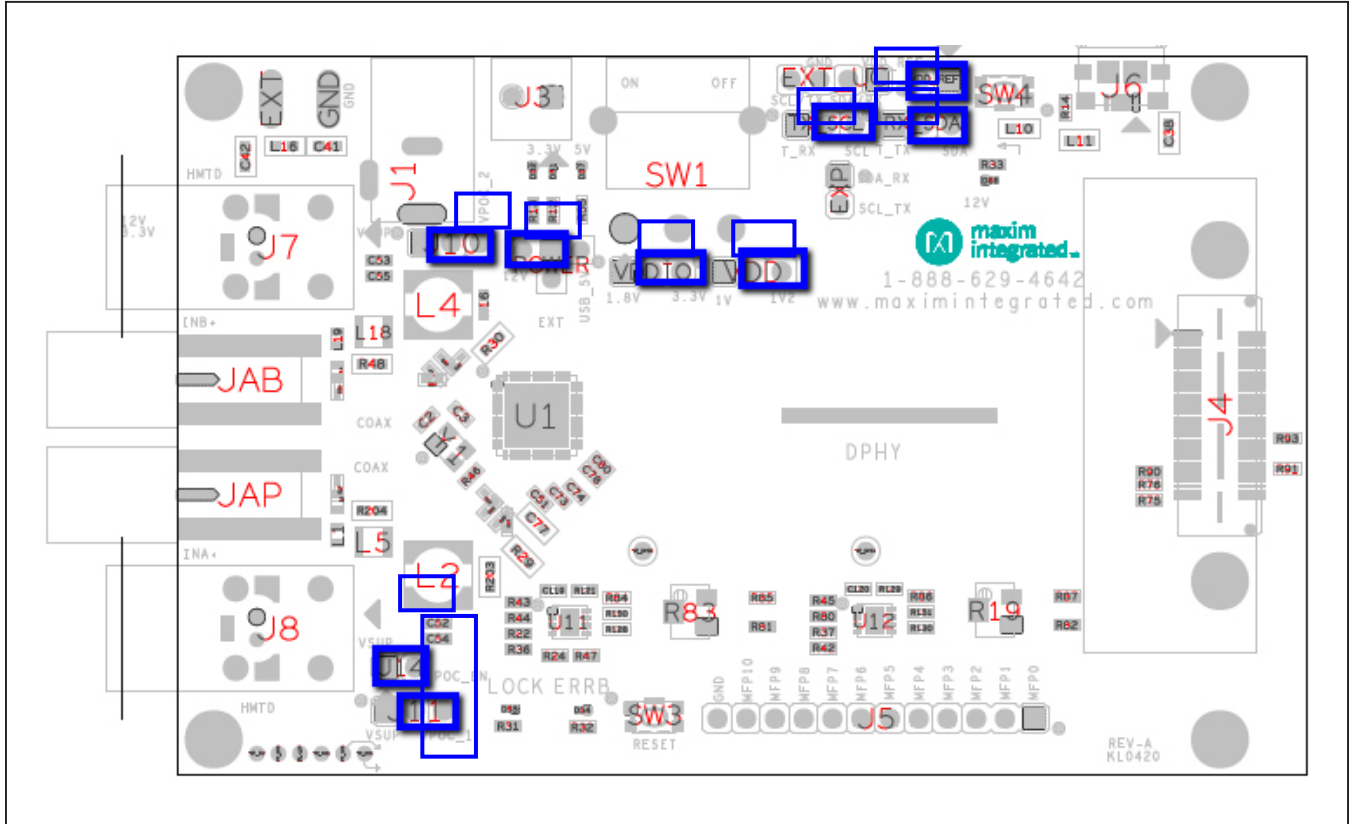


Figure 2: MAX96716 Deserializer EV Kit Default Jumper Settings

Quick Start

This procedure applies to COAX evaluation kits. [Figure 3](#) shows a typical application using the CSI serializer MAX96717 and CSI deserializer MAX96716.

Required Equipment

The following equipment is required to successfully use the MAX96716 EV kit in a serial link coax cable configuration.

- MAX96792/16 EV kit
- MAX9677 EV kit
- FAKRA coax cable assembly
- PC with Windows 7/Windows 10 and GMSL-2 software installed
- Power supply source (500mA USB port, 5V/1A DC supply, or 12V barrel jack DC supply)
- Micro USB cable

Procedure

The MAX96716 EV kit is shipped with the PCB fully assembled and tested. Use the following steps to verify board operation:

- 1) Download and install the latest GMSL-2 GUI software from the Maxim Integrated Sharefile onto a Windows 7/Windows 10 PC. Prior to using the GUI, the PC must be connected to the MAX96716 EV kit PCB through the board's micro-USB port (J6). Contact the factory for additional information on accessing the software. Refer to the *GMSL GUI User's Guide* for detailed instruction on using the software.
- 2) Check to assure that the MAX96716 EV kit PCB's red power switch (SW1) is in the OFF position.
- 3) Assure that all jumper positions on the PCB are properly set to meet the requirements of the user's application. [Figure 2](#) and [Table 2](#) show the possible jumper positions for various configurations. The default jumper settings put the Device Under Test (DUT) into I2C mode, select 1.8V as the VDDIO voltage, select 1V as the VDD voltage, and cause the board to be powered by 12V DC barrel jack.
- 4) Connect a power supply to the MAX96716 EV kit PCB. The board provides three power supply options:
 - 12V DC barrel jack supply connected to connector J1

- 5V external power supply connected to the external power terminal block (J3)
 - 5V supply drawn from the micro-USB port (J6) connected to the PC.
- 5) Power up the board by moving the red power switch (SW1) to the ON position. The power LEDs DS1 and DS2 light to indicate the appropriate power settings. The Teensy® LED (DS6) flashes to indicate that the board firmware is functional. (If the Teensy LED is not flashing, see the [Troubleshooting](#) section.)
 - 6) Define the application-specific power-up configuration for the DUT, using the GMSL-2 GUI to set the device's CFG pins into the required modes. (See the [Configuration \(CFG\) Pin Settings](#) section below). The MAX96716 must be configured to have same link data rate (6Gbps/3Gbps for GMSL-2) and output mode (coax or STP) as the companion serializer board. The DUT must be power cycled if any changes are made to the CFG pins (use the SW3 reset button on the board to power-cycle the DUT.)
 - 7) Connect the serializer-deserializer EV kit system as shown in [Figure 5](#). Connect the FAKRA cable from the OUTA or OUTB connectors on the serializer board to the FAKRA INA+ or INB+ connectors on the deserializer board.
 - 8) Connect a power supply to the serializer PCB, using either the 12V DC barrel jack supply, a 5V external power supply, or the 5V micro-USB port supply.
 - 9) Power on the serializer board by moving the red power switch to the ON position.
 - 10) When both boards have been connected properly and powered on, the LOCK LED on the MAX96716 EV kit PCB illuminates, indicating that the link is locked, and communication is functional. If the LOCK LED does not illuminate, see the [Troubleshooting](#) section below.

Basic board initialization is now complete. At this point, the link is established, and the system is ready to be used. Use the GMSL-2 GUI to access internal registers locally or remotely. Ensure that both serializer and deserializer are identified correctly in the GUI. Refer to the below sections and available documentation for additional information on using GMSL-2 hardware and software.

TEENSY is a registered trademark of PJRC.COM LLC.

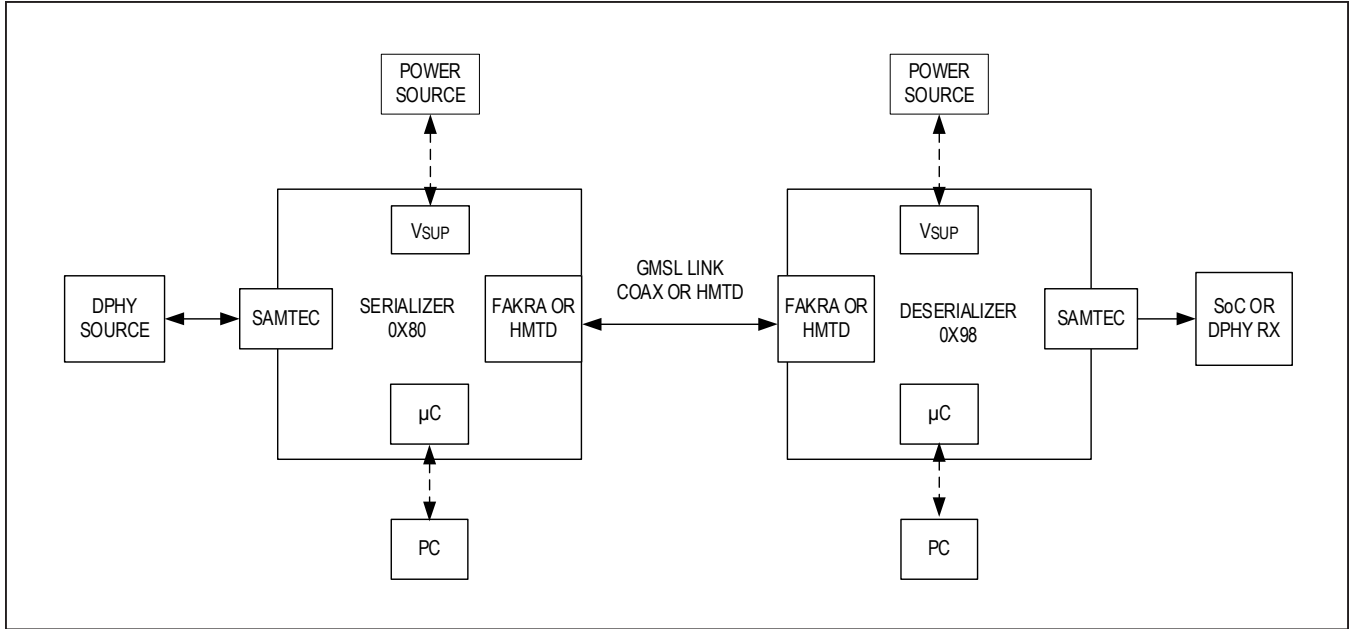


Figure 3. Typical Application Block Diagram Using the MAX96716

Configuration (CFG) Pin Settings

The deserializer CFG pins use the pin voltage latched at power-up to configure the device. On-board analog potentiometers and I2C-configurable digital potentiometers set the configuration (CFG) pin voltage levels. By default, the board is wired to use the digital potentiometers.

The CFG states can be configured using the GMSL-2 GUI. To do so, access the GUI tabs **Tools** → **Set CFG Pin Levels**.

To switch between using the analog or digital potentiometer to set CFG states, use 0 Ω resistors to connect the CFG0/1 nets. By default, the digital potentiometers are connected via R150 and R151. To use the analog potentiometers, depopulate R150/R151, and populate R84/R86. The analog potentiometers can be set with a small screwdriver and the voltage on the CFG pins can be monitored on the test points TP_CFG0 and TP_CFG1.

If the serializer is not identified in the GUI, it is still possible to write to the CFG pins. For more information, see the [Troubleshooting](#) section.

The voltage levels scale with IOVDD. [Table 1](#) indicates the voltage levels necessary to configure the serializer for different modes of operation.

Configuration-0 (CFG0) pin voltage sets the device address and I²C vs. UART mode. For example, to set device address 0x54 with I²C communication, apply 20.2% of VDDIO (CFG State 1) to pin CFG0.

Configuration-1 (CFG1) pin voltage sets coax vs. twisted pair mode (CXTX), data rate 3Gbps or 6Gbps and tunneling mode or pixel mode. For example, to set the DUT into Coax mode, 6Gbps and tunneling mode, apply 67.9% of VDDIO (CFG State 5) to pin CFG1.

After changing any CFG pin settings, power cycle the GMSL device to latch the new configuration settings.

By default, the EV kit is in CFG0 = 2, CFG1 = 7, mode for coax boards. For STP boards, the default modes are CFG0 = 2, CFG1 = 3.

Deserializer Jumper/Connector/Switch/ Test Point Descriptions

[Table 2](#) below contains detail of all connectors, jumpers, switches, and test point onboard the EV kit.

MAX96716 EV kit Package Contents

The MAX96716 Evaluation Kit package contains the items listed in [Table 3](#).

Table 1. MAX96716A CFG Pin Settings

| LEVEL # | VOLTAGE TYPICAL % VDDIO | CFG0 | | CFG1 | | |
|---------|-------------------------|------------------|----------------|------|------------------|--------------------|
| | | I2CSEL | DEVICE ADDRESS | CXTX | DATA RATE [GBPS] | TUNNEL/ PIXEL MODE |
| 0 | 0 | I ² C | 0x50 | STP | 3 | Tunnel |
| 1 | 20.2 | I ² C | 0x54 | STP | 6 | Tunnel |
| 2 | 32.1 | I ² C | 0x98 | STP | 3 | Pixel |
| 3 | 44.0 | I ² C | 0xD4 | STP | 6 | Pixel |
| 4 | 56.0 | UART | 0xD4 | COAX | 3 | Tunnel |
| 5 | 67.9 | UART | 0x98 | COAX | 6 | Tunnel |
| 6 | 79.8 | UART | 0x54 | COAX | 3 | Pixel |
| 7 | 100 | UART | 0x50 | COAX | 6 | Pixel |

Table 2. Deserializer Jumper/Connector/Switch/Test Point Description

| JUMPER | SIGNAL | DEFAULT POSITION | FUNCTION |
|----------|-------------------------|------------------|---|
| POWER | +12V, EXT PWR, 5V USB | +12V | Power to supply voltage VSUP |
| J3 | External supply input | Open | Pin header for GND connection and optional external voltage |
| J4 | SAMTEC connector | Open | Connector for MIPI signals and MFP (SPI, I ² C, GPIOs) signals |
| J5 | MFP signals | Open | Connection for MFP signals |
| J6 | USB Connection | Open | Connection from PC to TEENSY and +5V USB connection |
| J7, J8 | HMTD SIOA/B (±) | Open | HMTD connector for SIOA and SIOB GMSL signals |
| J10, J11 | VSUP, VPOC, SIOA/B(±) | Open | Connection between VSUP/VPOC and coax (FAKRA) connectors |
| J14 | VSUP | Open | Connection between VSUP and MAX20089 |
| VDDIO | VDDIO, 1.8V, 3.3V | 1.8V | Connection between VDDIO, 1.8V and 3.3V |
| VDD | VDD, 1V, 1.2V | 1V | Connection between VDD, 1V and 1.2V |
| VDD_REF | VDD_REF | 3.3V | Connection between VDD_REF and 3.3V for I ² C/UART lines |
| RX_SDA | UART TX, I2C SDA | TNZ_SDA | Selection of I ² C or UART connection to TEENSY |
| TX_SCL | UART RX, I2C SCL | TNZ_SCL | Selection of I ² C or UART connection to TEENSY |
| EXP | SDA_RX, SCL_TX | Open | External I ² C or UART connections |
| EXT_UC | SDA, SCL, GND, VDD_REF | Open | External I ² C or UART connections through the levels translator |
| JAP | COAX SIOA+ | Open | GMSL and PoC connection for COAX |
| SW1 | V _{SUP} /POWER | OFF | ON/OFF switch for board power |
| SW3 | PWDNB | OFF | Push button for DUT power off by pulling PWDNB = LOW |
| SW4 | (Flash µC) | OFF | Push button to program the Teensy microcontroller |
| TP_12V | +12V | N/A | Test point for 12V input |
| TP_3V3 | 3V3 | N/A | Test point for 3.3V rail |
| TP_2V5 | 2V5 | N/A | Test point for 2.5V rail |
| TP_1V8 | 1V8 | N/A | Test point for 1.8V rail |
| TP_1V2 | 1V2 | N/A | Test point for 1.2V rail |
| TP_1V | 1V0 | N/A | Test point for 1.0V rail |
| EXT | EXT | N/A | Wire loop for external power supply |

Table 3. Items Included in the Evaluation Kit Package

| ITEM DESCRIPTION | QTY |
|---|-----|
| MAX96792/MAX96716 variant of the EV kit | 1 |
| Micro-USB cable | 1 |
| +12V wall supply | 1 |
| COAX cable | 1 |

Troubleshooting

If the MAX96716 EV kit PCB fails to power-up or does not function properly, try the appropriate remedial actions below.

- 1) Make sure the board's red power switch (SW1) is set to the ON position.
- 2) Verify that the device is powered properly. Check to assure that the voltages at all device pins are within their operating ranges. The power rail LEDs (DS1, DS2) are a good indication that the critical rails (1.8V, 3.3V) are working.
- 3) Check that all jumpers are correctly set. Refer to the default jumper settings table in the serializer and deserializer EV kit data sheets. Also assure that all jumpers are firmly attached. Replace loose or damaged jumpers if necessary.
- 4) Check that the USB cable is properly seated in the USB port.
- 5) Check that the coax/STP cable connection between serializer and deserializer is good.
- 6) Check to see if the DUT has been inadvertently put into Teensy reset mode. The board's TEENSY_RST SW4 button should only be pressed when firmware is being flashed to the DUT. If the button is pressed during normal operation, the device goes into Teensy reset mode. Power cycle the board to resume normal operation with the current firmware.
- 7) Validate that the correct CFG pin voltages are being used to configure the serializer and deserializer. Check the method of biasing the CFG voltage at powerup. Measure the voltages at the pins. For details, see the [Configuration \(CFG\) Pin Settings](#) section.
- 8) If the CFG pin settings are incorrect, but the device is not identified in the GUI, proceed to the CFG pin page and set the desired CFG state values anyway. Reset the part and see if the GUI automatically identifies the device or if the device can be located using the **Identify Devices** drop-down from the **Options** tab. The low-level commands tab can be monitored to see if I²C writes to the CFG pots are successful.
- 9) Check that the I2C/UART jumpers match the DUT communication mode (SCL/SDA for I²C, TX/RX for UART).
- 10) Check that the AC coupling capacitors are populated correctly and routing the serial link to the correct connector for COAX or STP mode. For coax boards, capacitors C64 and C49 (PHY B) and capacitors C63 and C47 (PHY A) should be populated. For STP boards, capacitors C58 and C59 (PHY B) and capacitors C56 and C57 (PHY A) should be populated. (MAX96716 EV kit boards are shipped with the correct capacitors installed.)
- 11) Check if the LOCK LED is ON in the absence of a connection to the serializer. If so, one of the following conditions apply:
 - The DUT is not powered correctly
 - The DUT is damaged
 - The DUT is in incorrect mode
- 12) Check that the microcontroller firmware is active by observing the blinking red Teensy LED (DS6) at power-up. If the LED is not blinking, refer to the available software documentation to reprogram the microcontroller.
- 13) Check that the PC is detecting the COM port when the micro-USB cable is connected. Use the Windows Device Manager to check COM port status.
- 14) Power-cycle the board and reopen the GUI.
- 15) Try a new or different serializer or deserializer board.

Detailed Description of Hardware

The power configuration of the EV kit hardware may be re-configured to allow external supply connections. [Figure 4](#) shows the power connection options.

Component Suppliers

| SUPPLIER | PHONE | WEBSITE |
|--|-------------------|--|
| ECS, Inc. | 913-782-7787 | www.ecsxtal.com |
| KYOCERA | N/A | https://global.kyocera.com/ |
| Murata Electronics North America, Inc. | 770-436-1300 | www.murata-northamerica.com |
| Rosenberger Hochfrequenztechnik GmbH | 011-49-86 84-18-0 | www.rosenberger.de |
| TDK Corp. | 847-803-6100 | product.tdk.com/info/en/catalog/index.html |
| Diodes Incorporated | 972-987-3900 | www.diodes.com |
| ROHM | N/A | www.rohm.com |
| Sullins Electronics Corp | 760-744-0125 | www.sullinscorp.com |
| Panasonic North America | N/A | na.panasonic.com/us/ |
| Coilcraft | 847-639-6400 | www.coilcraft.com |

Ordering Information

| PART | TYPE |
|--------------------|--|
| MAX96716A-BCK-EVK# | Dual GMSL2 to CSI-2 Deserializer, 3/6Gbps, DPHY w/HMTD |
| MAX96716A-BAK-EVK# | Dual GMSL2 to CSI-2 Deserializer, 3/6Gbps, DPHY w/COAX |
| MAX96716F-BCK-EVK# | Dual GMSL2 to CSI-2 Deserializer, 3Gbps, DPHY w/HMTD |
| MAX96716F-BAK-EVK# | Dual GMSL2 to CSI-2 Deserializer, 3Gbps, DPHY w/COAX |

#Denotes RoHs compliance.

*Future product—contact factory for availability.

Note: The MAX96716 EV kits are normally ordered with a companion serializer board

- MAX96717 EV kit.

MAX96716 EV Kit Bill of Materials (Coax)

| ITEM | REF_DES | DNI/DNP | QTY | MFG PART # | MANUFACTURER | VALUE | DESCRIPTION | COMMENTS |
|------|--|---------|-----|---|--|------------------|--|----------|
| 1 | C1, C4, C5, C10, C11, C17, C18, C26, C29-C32, C34-C37, C39, C40, C46, C50-C53, C71, C74, C75, C80, C81, C119, C120 | - | 30 | C1005X7R1C104K050BC; ATC530L104KT16; 0402Y104KAT2A; C0402X7R160-104KNE; CL05B104K05NNNC; GRM155R71C104KA88; C1005X7R1C104K; CC0402KRX7R7BB104; EMK105B7104KV; CL05B104K05 | TDK; AMERICAN TECHNICAL CERAMICS; AVK; VENKEL LTD.; SAMSUNG ELECTRONICS; MURATA;TDK;YAGEO PHICOMP; TAIYO YUDEN;SAMSUNG ELECTRONICS | 0.1UF | CAPACITOR; SMT (0402); CERAMIC CHIP; 0.1UF; 16V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R | |
| 2 | C2 | - | 1 | C1005COG1H220G050 | TDK | 22PF | CAPACITOR; SMT (0402); CERAMIC CHIP; 22PF; 50V; TOL=2%; TG=-55 DEGC TO +125 DEGC; TC=COG | |
| 3 | C3 | - | 1 | C0402COG500270INP; GRM1555C1H270JA01 | VENKEL LTD.;MURATA | 27PF | CAPACITOR; SMT; 0402; CERAMIC; 27pF; 50V; 5%; COG; -55degC to + 125degC; 0 +/-30PPM/degC | |
| 4 | C6, C7 | - | 2 | TAJC476K020RNJ | AVX | 47UF | CAPACITOR; SMT (6032); TANTALUM CHIP; 47UF; 20V; TOL=10%; MODEL=TAJ SERIES; TG=-55 DEGC TO +125 DEGC | |
| 5 | C8, C9, C12-C14, C19-C25, C38, C43-C45, C48, C77 | - | 18 | GRT188R61C106KE13 | MURATA | 10UF | CAPACITOR; SMT (0603); CERAMIC CHIP; 10UF; 16V; TOL=10%; TG=-55 DEGC TO +85 DEGC; TC=X5R; AUTO | |
| 6 | C15 | - | 1 | C1608X7R1V105K080AC; CGA3E1X7R1V105K080AC | TDK;TDK | 1UF | CAPACITOR; SMT (0603); CERAMIC CHIP; 1UF; 35V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R | |
| 7 | C16, C28, C33 | - | 3 | GRM188Z71C225KE43 | MURATA | 2.2UF | CAPACITOR; SMT (0603); CERAMIC CHIP; 2.2UF; 16V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R | |
| 8 | C27 | - | 1 | T491X107K025A | KEMET | 100UF | CAPACITOR; SMT (7343-43); TANTALUM CHIP; 100UF; 25V; TOL=10% | |
| 9 | C41, C42 | - | 2 | C1608X5R0J475M080AB; GRM188R60J475ME19; JMK107BJ475MA | TDK;MURATA;TAIYO YUDEN | 4.7UF | CAPACITOR; SMT (0603); CERAMIC; 4.7UF; 6.3V; TOL=20%; MODEL=C SERIES; TG=-55 DEGC TO +85 DEGC; TC=X5R | |
| 10 | C47, C49, C63, C64 | - | 4 | UMK105BJ224KV | TAIYO YUDEN | 0.22UF | CAPACITOR; SMT (0402); CERAMIC CHIP; 0.22UF; 50V; TOL=10%; TG=-55 DEGC TO +85 DEGC; TC=X5R | |
| 11 | C54, C55 | - | 2 | GRM155R71H103JA88 | MURATA | 0.01UF | CAPACITOR; SMT (0402); CERAMIC CHIP; 0.01UF; 50V; TOL=5%; TG=-55 DEGC TO +125 DEGC; TC=X7R | |
| 12 | C72, C73, C76, C78, C79 | - | 5 | C0402C103K5RAC; GRM155R71H103KA88; C1005X7R1H103K050BE; CL05B103KB5NNN; UMK105B7103KV | KEMET;MURATA;TDK; SAMSUNG ELECTRONIC; TAIYO YUDEN | 0.01UF | CAPACITOR; SMT (0402); CERAMIC CHIP; 0.01UF; 50V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R | |
| 13 | D1, D2 | - | 2 | ES1D | FAIRCHILD SEMICONDUCTOR | ES1D | DIODE; RECT; SMA (DO-214AC); PIV=200V; IF=1A | |
| 14 | D3 | - | 1 | DFLS140L | DIODES INCORPORATED | DFLS140L | DIODE; SCH; SMT (POWERDI-123); PIV=40V; IF=1A | |
| 15 | D4 | - | 1 | B360B-13-F | DIODES INCORPORATED | B360B-13-F | DIODE; SCH; SCHOTTKY BARRIER DIODE; SMB; PIV=60V; Io=3A; -55 DEGC TO +125 DEGC | |
| 16 | DS1, DS2, DSS, DS7 | - | 4 | SML-P11MTT86 | ROHM | SML-P11MTT86 | DIODE; LED; SMT; PIV=5V; IF=0.02A | |
| 17 | D54, D56 | - | 2 | SML-P11UTT86 | ROHM | SML-P11UTT86 | DIODE; LED; SMT; PIV=1.8V; IF=0.02A | |
| 18 | EXP, J14, VDD_REF | - | 3 | PBC025AAN | SULLINS ELECTRONICS CORP. | PBC025AAN | CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 2PINS | |
| 19 | EXT, GND | - | 2 | 9020 BUSS | WEICO WIRE | MAXIMPAD | EVK KIT PARTS; MAXIM PAD; WIRE; NATURAL; SOLID; WEICO WIRE; SOFT DRAWN BUS TYPE-S; 20AWG | |
| 20 | EXT_UC | - | 1 | PBC045AAN | SULLINS ELECTRONICS CORP. | PBC045AAN | CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 4PINS; -65 DEGC TO +125 DEGC | |
| 21 | J1 | - | 1 | PJ-002AH | CUI INC. | PJ-002AH | CONNECTOR; MALE; THROUGH HOLE; DC POWER JACK; RIGHT ANGLE; 3PINS | |
| 22 | J3 | - | 1 | 393570002 | MOLEX | 393570002 | CONNECTOR; FEMALE; THROUGH HOLE; 0.3MM PITCH BEAU EUROSTYLE FIXED MOUNT PCB TERMINAL BLOCK; RIGHT ANGLE; 2PINS | |
| 23 | J4 | - | 1 | QSH-030-01-L-D-A | SAMTEC | QSH-030-01-L-D-A | CONNECTOR; MALE; SMT; HI-SPEED GROUND PLANE SOCKETS; STRAIGHT THROUGH; 60PINS; -55 DEGC TO +125DEGC | |
| 24 | J5 | - | 1 | PBC125AAN | SULLINS ELECTRONICS CORP. | PBC125AAN | CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 12PINS; -65 DEGC TO +125 DEGC | |
| 25 | J6 | - | 1 | 1981568-1 | TE CONNECTIVITY | 1981568-1 | CONNECTOR; FEMALE; SMT; MICRO USB STANDARD TYPE B ASSY; RIGHT ANGLE; SPINS | |
| 26 | J10, J11, RX_SDA, TX_SCL, VDD, VDDIO | - | 6 | PBC035AAN | SULLINS | PBC035AAN | CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 3PINS; -65 DEGC TO +125 DEGC | |
| 27 | JAB, JAP | - | 2 | 5952AQ-40MT5-Z_1 | ROSENBERGER | 5952AQ-40MT5-Z_1 | CONNECTOR; MALE; THROUGH HOLE; FAKRA-HF RIGHT ANGLE PLUG PCB WITH HOUSING; RIGHT ANGLE; 5PINS | |
| 28 | L1, L3, L6, L19 | - | 4 | PFL1609-471ME | COILCRAFT | 0.47UH | INDUCTOR; SMT; SHIELDED; 0.47UH; 20%; 1.3A | |
| 29 | L2, L4 | - | 2 | MSS6132T-223ML | COILCRAFT | 22UH | INDUCTOR; SMT; SHIELDED; 22UH; 20%; 1.9A | |
| 30 | L5, L18 | - | 2 | 1210POC-682MR | COILCRAFT | 6.8UH | EVKIT PART-INDUCTOR; SMT; FERRITE; CHOKE; TOL=+/-20%; 1A | |

MAX96716 EV Kit Bill of Materials (Coax) (continued)

| ITEM | REF_DES | DNI/DNP | QTY | MFG PART # | MANUFACTURER | VALUE | DESCRIPTION | COMMENTS |
|------|--|---------|-----|--|-------------------------------|--------------------|---|----------|
| 31 | L7-L11 | - | 5 | BLM18KG601SN1 | MURATA | 600 | INDUCTOR; SMT (0603); FERRITE-BEAD; 600; TOL=+/-25%; 1.3A | |
| 32 | L12, L15 | - | 2 | DFE252012P-4R7M=P2 | MURATA | 4.7UH | INDUCTOR; SMT (2520); FERRITE CORE; 4.7UH; TOL=+/-20%; 1.7A | |
| 33 | L13, L14 | - | 2 | TFM201610ALMA2R2MTAA | TDK | 2.2UH | INDUCTOR; SMT (2016); THIN FILM; 2.2UH; TOL=+/-20%; 2.1A | |
| 34 | L16 | - | 1 | BLM18SG121TN1 | MURATA | 120 | INDUCTOR; SMT (0603); FERRITE-BEAD; 120; TOL=+/-25%; 3A | |
| 35 | L17 | - | 1 | RFCMF1220100M3 | WALSIN TECHNOLOGY CORPORATION | RFCMF1220100M3 | INDUCTOR; SMT; CERAMIC CHIP; CHOKE; 0.3A | |
| 36 | POWER | - | 1 | PEC04SAAN | SULLINS ELECTRONICS CORP. | PEC04SAAN | CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 4PINS | |
| 37 | R1-R3, R13, R20, R21, R23, R24, R26, R34,R40, R41, R47 | - | 13 | ERJ-2GEJ103 | PANASONIC | 10K | RESISTOR; 0402; 10K OHM; 5%;200PPM; 0.10W; THICK FILM | |
| 38 | R4, R5 | - | 2 | ERJ-2GEJ203 | PANASONIC | 20K | RESISTOR; 0402; 20K OHM; 5%; 200PPM; 0.10W; THICK FILM | |
| 39 | R6-R9, R11 | - | 5 | CRCW06030000ZS; MCR03EZPJ000; ERJ-3GEYOR00 | VISHAY DALE;ROHM; PANASONIC | 0 | RESISTOR; 0603; 0 OHM; 0%; JUMPER; 0.10W; THICK FILM | |
| 40 | R12, R31-R33 | - | 4 | ERJ-2RKF1001 | PANASONIC | 1K | RESISTOR; 0402; 1K OHM; 1%; 100PPM; 0.10W; THICK FILM | |
| 41 | R14, R22, R37-R39, R43-R46, R53, R54, R72-R74, R80, R150, R151 | - | 17 | ERJ-2GEOR00 | PANASONIC | 0 | RESISTOR; 0402; 0 OHM; 0%; JUMPER; 0.10W; THICK FILM | |
| 42 | R15, R27 | - | 2 | CRCW040233R0FK | VISHAY DALE | 33 | RESISTOR, 0402, 33 OHM, 1%, 100PPM, 0.0625W, THICK FILM | |
| 43 | R16, R48, R203, R204 | - | 4 | ERJ-3EKF5101 | PANASONIC | 5.1K | RESISTOR; 0603; 5.1K OHM; 1%; 100PPM; 0.10W; THICK FILM | |
| 44 | R19, R83 | - | 2 | 3214W-1-204 | BOURNS | 200K | RESISTOR; SMT-J LEAD; 3214 SERIES; 200K OHM; 10%; 100PPM; 0.25W | |
| 45 | R28 | - | 1 | ERJ-2RKF4700 | PANASONIC | 470 | RESISTOR; 0402; 470 OHM; 1%; 100PPM; 0.1W; THICK FILM | |
| 46 | R29, R30 | - | 2 | CRCW060349R9FK | VISHAY DALE | 49.9 | RESISTOR; 0603; 49.9 OHM; 1%; 100PPM; 0.10W; THICK FILM | |
| 47 | R35 | - | 1 | CRCW0603402RFK | VISHAY DALE | 402 | RESISTOR; 0603; 402 OHM; 1%; 100PPM; 0.10W; THICK FILM | |
| 48 | R49 | - | 1 | ERJ-2GEJ104 | PANASONIC | 100K | RESISTOR; 0402; 100K OHM; 5%; 200PPM; 0.10W; THICK FILM | |
| 49 | R55 | - | 1 | CRCW04022K20FK; RC0402FR-072K2L | VISHAY DALE; YAGEO PHICOMP | 2.2K | RESISTOR, 0402, 2.2K OHM, 1%, 100PPM, 0.0625W, THICK FILM | |
| 50 | R81, R82, R85, R87, R121, R128-R130 | - | 8 | ERJ-2RKF4991 | PANASONIC | 4.99K | RESISTOR; 0402; 4.99K OHM; 1%; 100PPM; 0.10W; THICK FILM | |
| 51 | SW1 | - | 1 | 1101-M2-S3-A-Q-E-2 | C&K COMPONENTS | 1101-M2-S3-A-Q-E-2 | SWITCH; SPDT; THROUGH HOLE; RIGHT ANGLE; 120V; 6A; 1000 SERIES; RCOIL=0.1 OHM; RINSULATION=100G OHM | |
| 52 | SW3, SW4 | - | 2 | KMR421G LFS | C&K COMPONENTS | KMR421G LFS | SWITCH; SPST; SMT; STRAIGHT; 32V; 0.05A; MICROMINIATURE SMT TOP ACTUATED; RCOIL=0.1 OHM OHM; RINSULATION=1G OHM OHM | |
| 53 | TP_CFG0, TP_CFG1 | - | 2 | 5000 | KEystone | N/A | TEST POINT; PIN DIA=0.1IN; TOTAL LENGTH=0.3IN; BOARD HOLE=0.04IN; RED; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH; | |
| 54 | U1 | - | 1 | MAX96716AGTM/VY+; MAX96716FGTM/VY+; MAX96716KGTM/VY+; MAX96718AGTM/VY+; MAX96718FGTM/VY+; MAX96792AGTM/VY+ | MAXIM | MAX96716AGTM/VY+ | EVKIT PART - IC; MAX96792AGTM/VY+; MAX96716AGTM/VY+; MAX96716FGTM/VY+; MAX96716KGTM/VY+; MAX96718AGTM/VY+; MAX96718FGTM/VY+; DUAL GMSL2 TO CSI-2 DESERIALIZER; PACKAGE OUTLINE: 21-100045; LAND PATTERN: 90-100016; PACKAGE CODE: T4877Y+11 | |
| 55 | U2 | - | 1 | MAX20019ATBI/V+ | MAXIM | MAX20019ATBI/V+ | EVKIT PART-IC; VCON; 3.2MHZ; 500MILLIAMPERE DUAL STEP-DOWN CONVERTER FOR AUTOMOTIVE CAMERA; PACKAGE OUTLINE: 21-100125; LAND PATTERN DRAWING NO.: 90-100079; PACKAGE CODE: T1032+2C; TDFN10-EP | |
| 56 | U3 | - | 1 | MK20DX256VLH7 | FREESCALE | MK20DX256VLH7 | IC; UCON; KINETIS K2X MCU FAMILY; LQFP64 | |
| 57 | U4 | - | 1 | IC_MKL02Z32_QFN16 | PJRC | IC_MKL02Z32_QFN16 | IC; UCON; KINETIS KL02 32 KB FLASH; 48 MHZ CORTEX-M0+ BASED MICROCONTROLLER; MKL02 CHIP WITH PRE-PROGRAMMED TEENSY LC AND 3.2 BOOTLOADER; QFN16-EP | |
| 58 | U5, U6 | - | 2 | MAX3373EEKA+ | MAXIM | MAX3373EEKA+ | IC; TRANS; +/-15KV ESD-PROTECTED; 16MPBS; DUAL LOW-VOLTAGE LEVEL TRANSLATOR; SOT23-8 | |
| 59 | U7, U8 | - | 2 | 74LVC1G86GV | NXP | 74LVC1G86GV | IC; XOR; 2-INPUT EXCLUSIVE-OR GATE; SOT753 | |

MAX96716 EV Kit Bill of Materials (Coax) (continued)

| ITEM | REF_DES | DNI/DNP | QTY | MFG PART # | MANUFACTURER | VALUE | DESCRIPTION | COMMENTS |
|-------|------------------------------|---------|-----|--|------------------------------------|------------------|--|----------|
| 60 | U9 | - | 1 | MAX16922ATPH/V+ | MAXIM | MAX16922ATPH/V+ | IC; CONV; 2.2MHZ; DUAL; STEP-DOWN DC-DC CONVERTER; DUAL LDOS AND RESET; TQFN20-EP | |
| 61 | U10 | - | 1 | MAX20089ATPA/VY+ | MAXIM | MAX20089ATPA/VY+ | IC; PROT; DUAL CAMERA POWER PROTECTORS; TQFN20-EP; PACKAGE OUTLINE DRAWING: 21-100172; PACKAGE CODE: T2044+4C; PACKAGE LAND PATTERN: 90-0409 | |
| 62 | U11 | - | 1 | MAX5419LETA+ | MAXIM | MAX5419LETA+ | IC; DPOT; 200K OHM; 256-TAP NONVOLATILE I2C-INTERFACE DIGITAL POTENTIOMETER; TDFN8-EP | |
| 63 | U12 | - | 1 | MAX5419META+ | MAXIM | MAX5419META+ | IC; DPOT; 200K OHM; 256-TAP NONVOLATILE I2C-INTERFACE DIGITAL POTENTIOMETER; TDFN8-EP | |
| 64 | Y1 | - | 1 | ECS-250-18-33Q-DS | ECS INC | 25MHZ | CRYSTAL; SMT 3.2X2.5; 18PF; 25MHZ; +/-30PPM; +/-100PPM | |
| 65 | Y2 | - | 1 | CX2016DB16000DOWZRC1 | KYOCERA | 16MHZ | CRYSTAL; SMT 2.0 MM X 1.6 MM; 8PF; 16MHZ; +/-25PPM; +/-40PPM | |
| 66 | PCB | - | 1 | MAX96716DPHY | MAXIM | PCB | PCB:MAX96716DPHY | |
| 67 | EV_KIT_BOX3 | - | 1 | GKFYACRYL-001 | GEEKIFY | N/A | EVKIT PART-ACCESSORY; PLASTIC COVER; TOP PLASTIC COVER WITH MAXIM LOGO | |
| 68 | EV_KIT_BOX3 | - | 1 | GKFYACRYL-002 | GEEKIFY | N/A | EVKIT PART-ACCESSORY; PLASTIC COVER; BOTTOM PLASTIC COVER WITHOUT MAXIM LOGO | |
| 69 | EV_KIT_BOX3 | - | 4 | BS34CL06X25AP | BUMPER SPECIALTIES INC. | N/A | BUMPER; CLEAR-CYLINDRICAL SHAPE; 0.375D/0.125H; POLYURETHANE | |
| 70 | EV_KIT_BOX3 | - | 4 | 4802 | KEystone | N/A | STANDOFF; MALE_FEMALE-THREADED; HEX; 4-40IN; 0.50IN; NYLON | |
| 71 | EV_KIT_BOX3 | - | 4 | 1902D | KEystone | N/A | STANDOFF; FEMALE-THREADED; HEX; 4-40IN; 3/4IN; NYLON | |
| 72 | EV_KIT_BOX3 | - | 8 | NY PMS 440 0025 PH | B&F FASTENER SUPPLY | N/A | MACHINE SCREW; PHILLIPS; PAN; 4-40; 1/4IN; NYLON | |
| 73 | EV_KIT_BOX4 | - | 2 | 24480 | KEystone | N/A | STANDOFF; FEMALE-THREADED; HEX; M3; 5MM; STEEL | |
| 74 | EV_KIT_BOX4 | - | 4 | RM3X4MM 2701 | APM HEXSEAL | N/A | MACHINE SCREW; PHILLIPS; PAN; M3; 4MM; STAINLESS STEEL | |
| 75 | EV_KIT_BOX5 | - | 9 | NPC02SXON-RC | SULLINS ELECTRONICS CORP. | N/A | CONNECTOR; FEMALE; MINI SHUNT; 0.100IN CC; OPEN TOP; JUMPER; STRAIGHT; 2PINS | |
| 76 | PACKOUT_BOX | DNI | 1 | AK67421-0.5 | ASSMANN | N/A | CONNECTOR; USB CABLE; MALE-MALE; USB 2.0; 5PINS-4PINS; 500MM | |
| 77 | PACKOUT_BOX | DNI | 1 | WSU120-2000 | TRIAD MAGNETICS | N/A | ACCESSORY; WALL ADAPTER; VI-(90-264VAC); VO-(12VDC); 6FT | |
| 78 | PACKOUT_BOX | DNI | 1 | SK-5115 | AMPHENOL ADRONICS | N/A | CONNECTOR; COAX CABLE; MALE-FEMALE; WIREMOUNT; 2000MM; | |
| 79 | C56-C59 | DNP | 0 | UMK105BJ224KV | TAIYO YUDEN | 0.22UF | CAPACITOR; SMT (0402); CERAMIC CHIP; 0.22UF; 50V; TOL=10%; TG=-55 DEGC TO +85 DEGC; TC=X5R | |
| 80 | J7, J8 | DNP | 0 | E6S201-40MT5-Z | ROSENBERGER | E6S201-40MT5-Z | EVKIT PART - CONNECTOR; MALE; THROUGH HOLE; PLUG PCB; RIGHT ANGLE; 2PINS; | |
| 81 | R10 | DNP | 0 | CRCW06030000Z5; MCR03EZPJ000; ERJ-3GEYOR00 | VISHAY DALE; ROHM; PANASONIC | 0 | RESISTOR; 0603; 0 OHM; 0%; JUMPER; 0.10W; THICK FILM | |
| 82 | R17, R25 | DNP | 0 | ERJ-2RKF4872 | PANASONIC | 48.7K | RESISTOR; 0402; 48.7K OHM; 1%; 100PPM; 0.1W; THICK FILM | |
| 83 | R18 | DNP | 0 | CRCW0402200KFK; RF73H1ELTP2003 | VISHAY DALE; KOA SPEER ELECTRONICS | 200K | RESISTOR; 0402; 200K; 1%; 100PPM; 0.0625W; THICK FILM | |
| 84 | R36, R42, R84, R86, R88, R89 | DNP | 0 | ERJ-2GEOR00 | PANASONIC | 0 | RESISTOR; 0402; 0 OHM; 0%; JUMPER; 0.10W; THICK FILM | |
| 85 | R75-R79, R90, R91, R93, R94 | DNP | 0 | ERJ-2GEOR00 | PANASONIC | 0 | RESISTOR; 0402; 0 OHM; 0%; JUMPER; 0.10W; THICK FILM | DNI |
| TOTAL | | | 242 | | | | | |

MAX96716 EV Kit Schematics

MAX96716 DPHY 2X4 EVKIT
GMSL APPS SUPPORT TEAM

CONTENTS

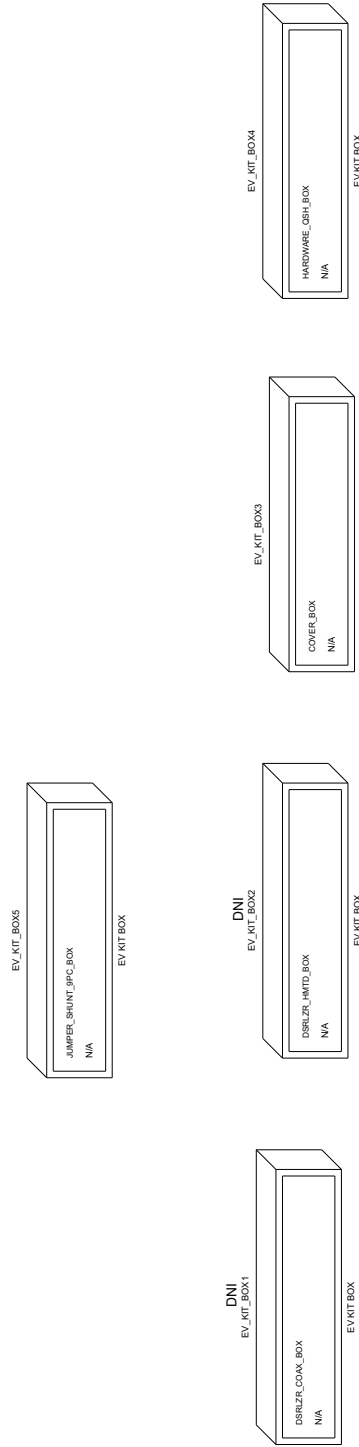
PAGE2 - GMSL- MAIN

PAGE3 - MCU AND PERIPHERALS

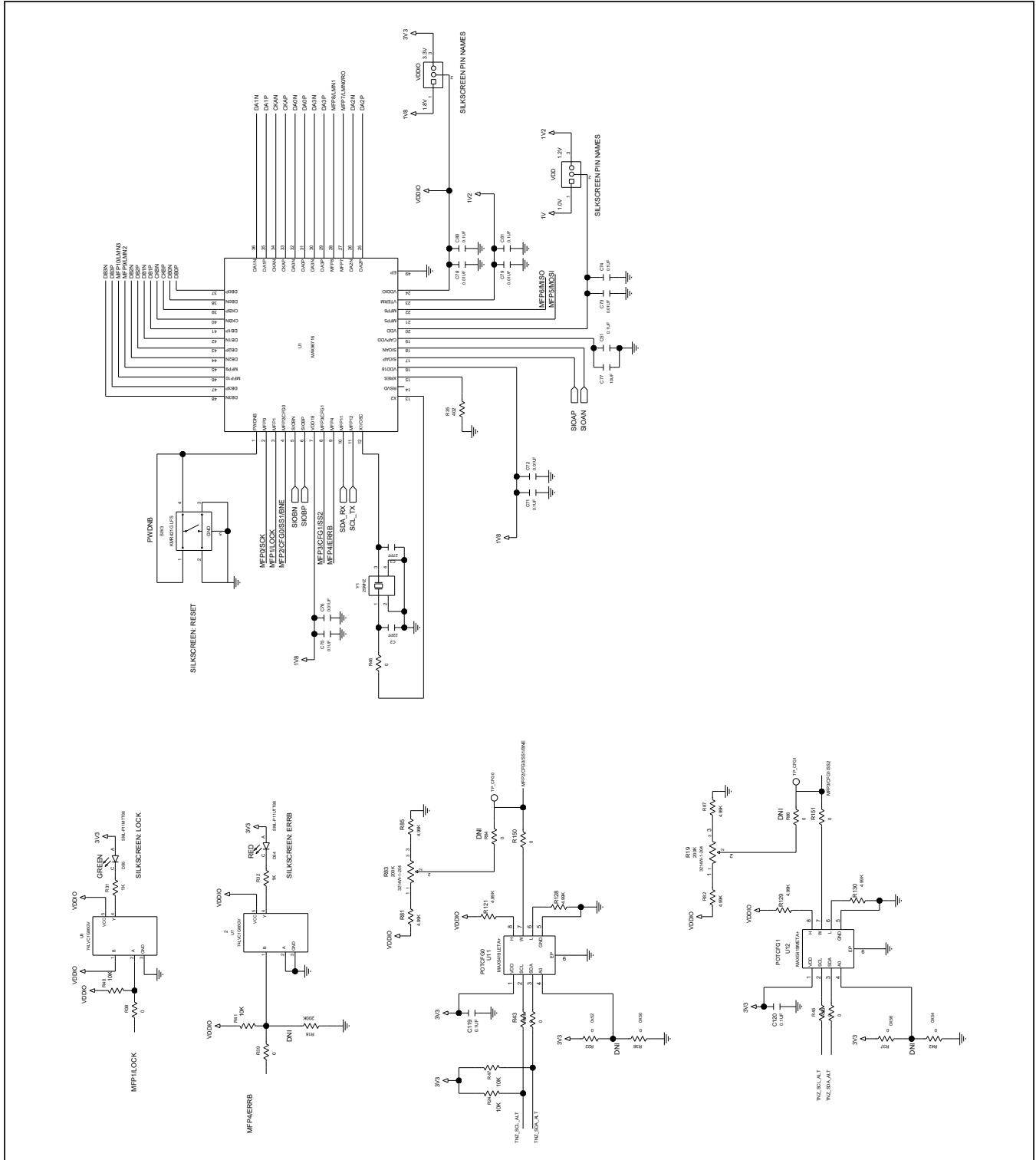
PAGE4 - POWER

PAGE5 - COAX AND HMTD

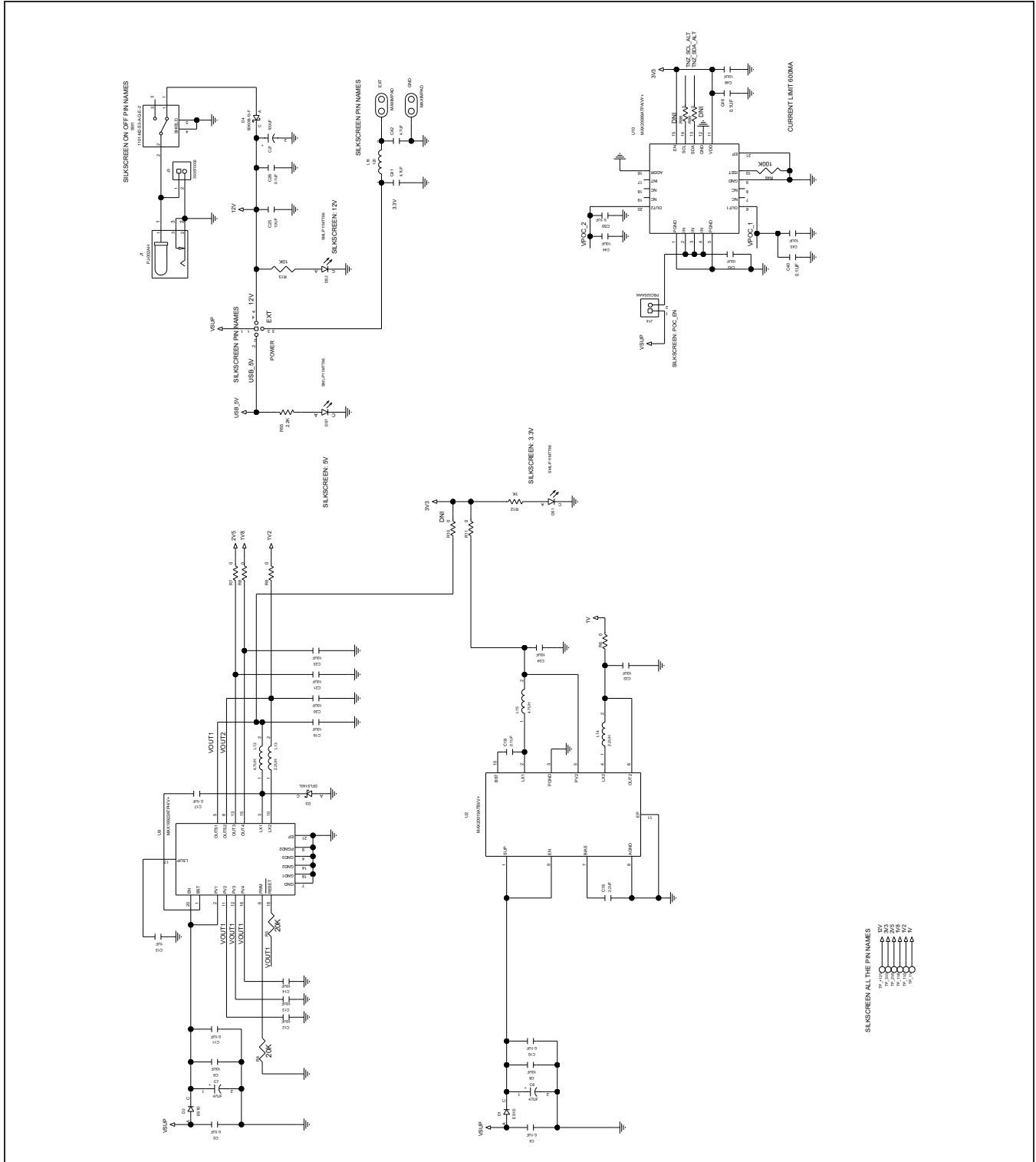
PAGE6 - CONNECTORS



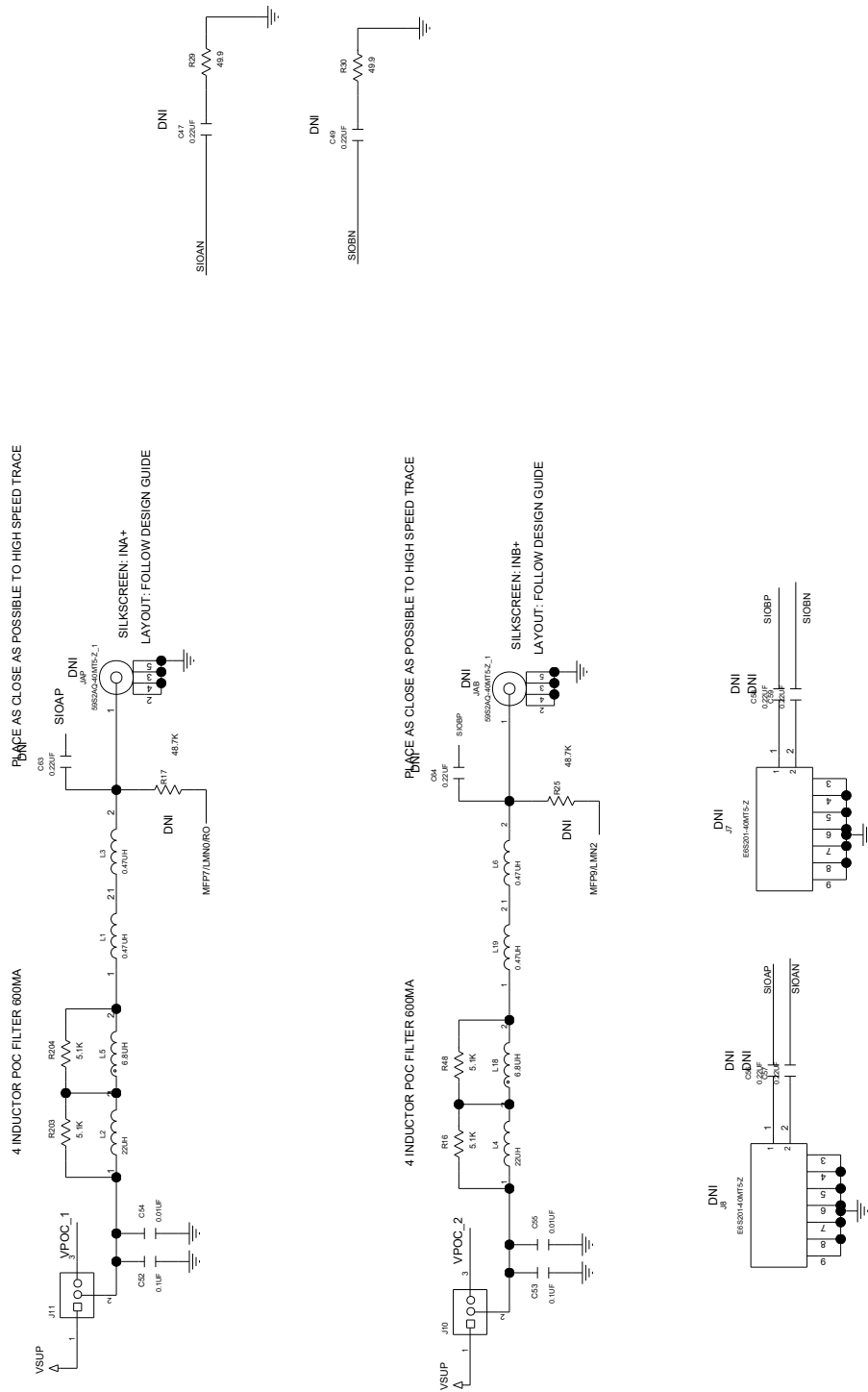
MAX96716 EV Kit Schematics (continued)



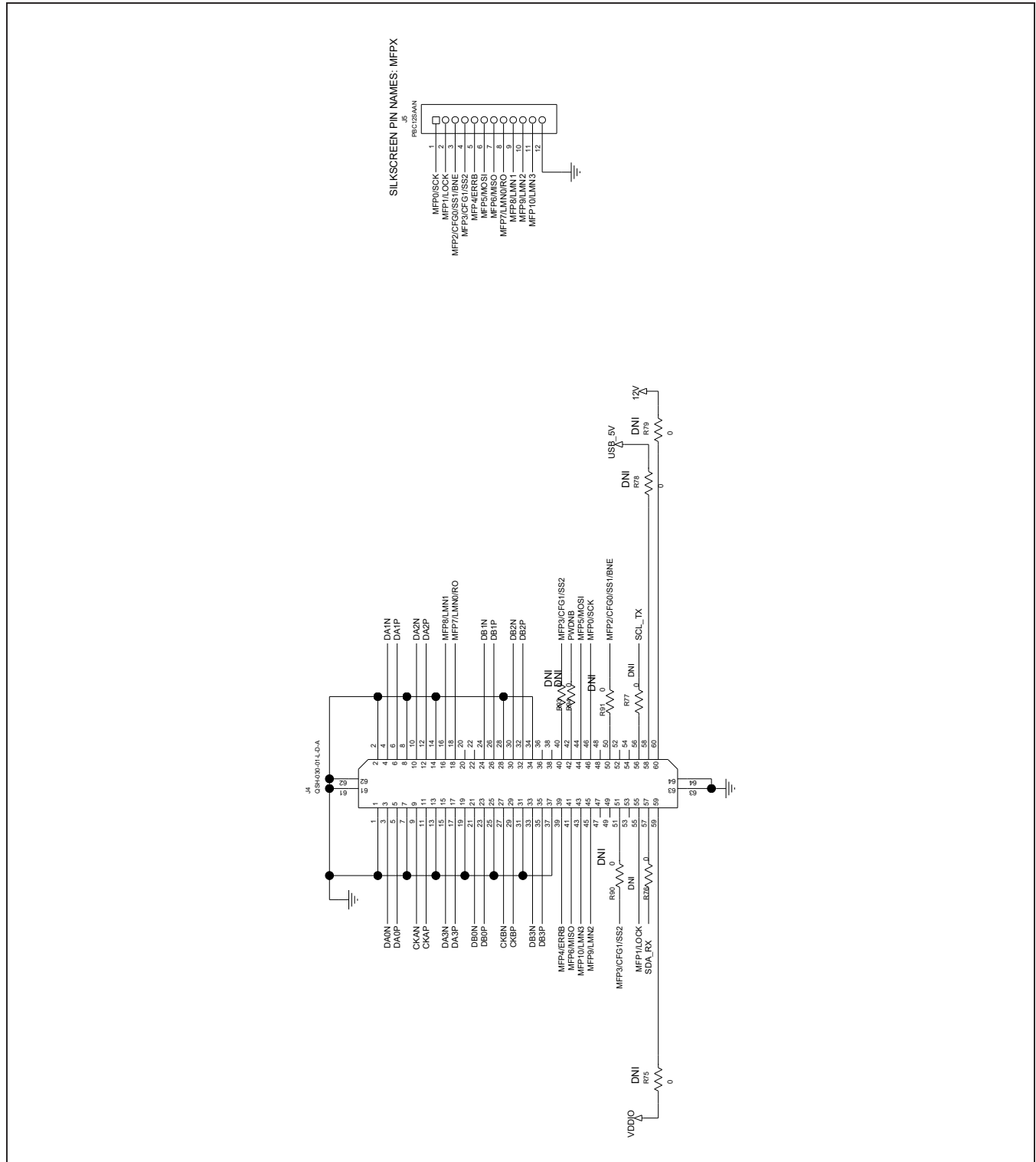
MAX96716 EV Kit Schematics (continued)



MAX96716 EV Kit Schematics (continued)



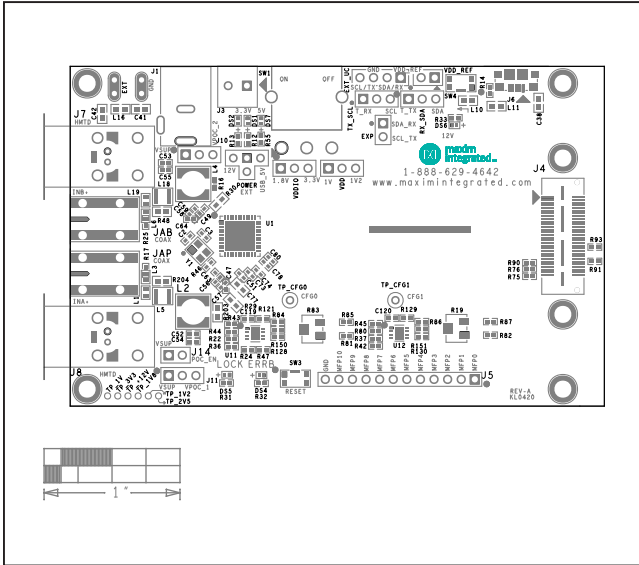
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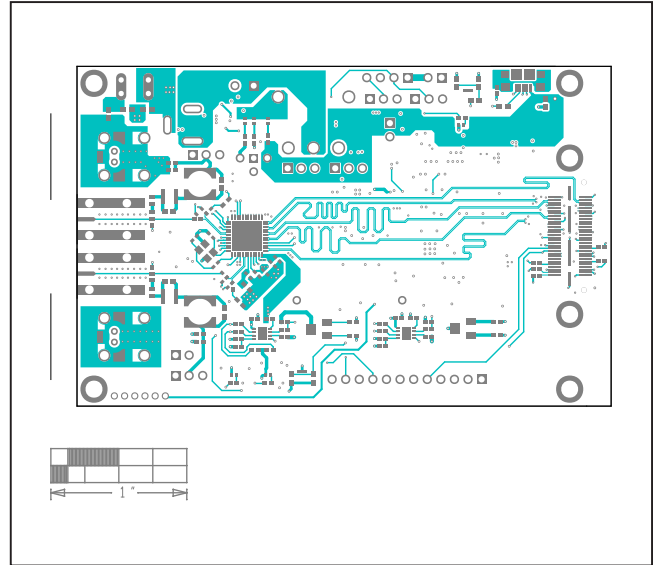
MAX96716 DPHY Evaluation Kit

Evaluates: MAX96716A, MAX96716F

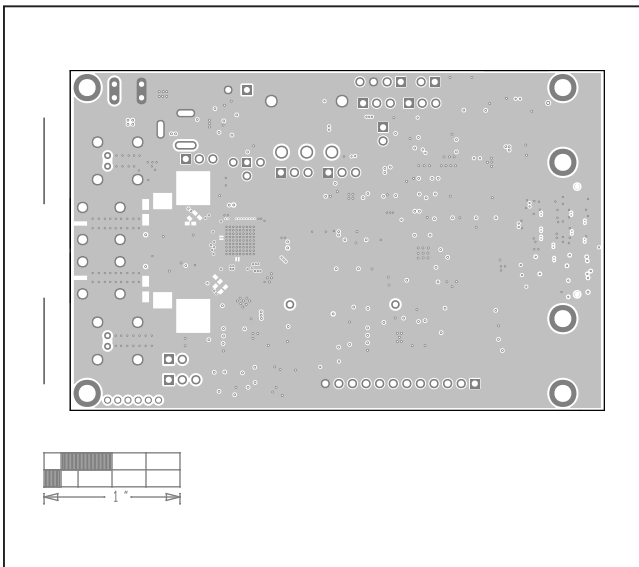
MAX96716 EV Kit PCB Layout Diagrams



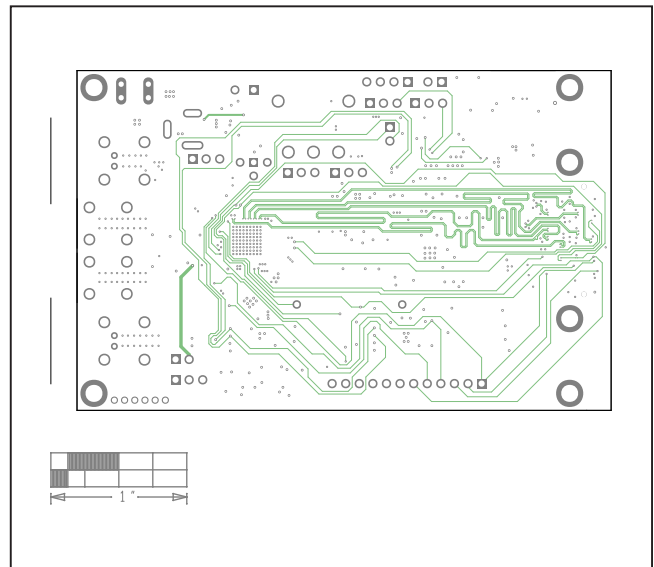
MAX96716 EV Kit Component Placement Guide—Top Silkscreen



MAX96716 EV Kit Component Placement Guide—Top

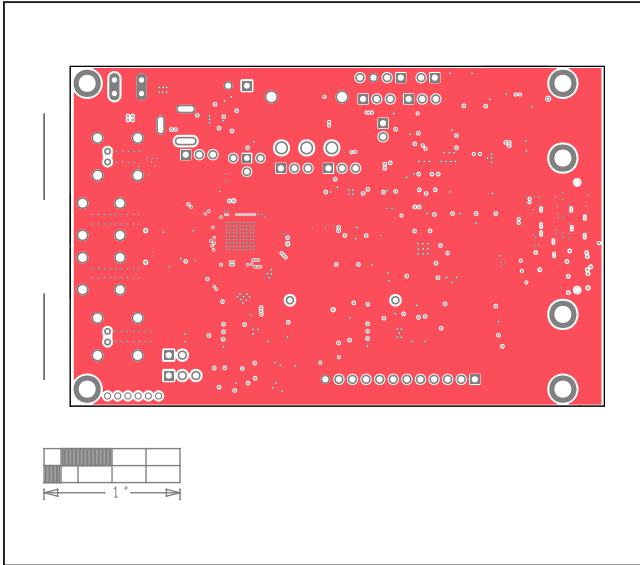


MAX96716 EV Kit Component Placement Guide—L2_GND

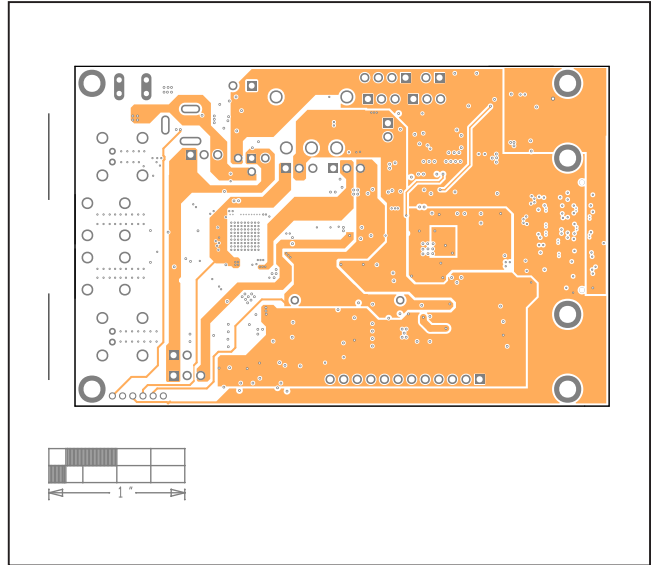


MAX96716 EV Kit Component Placement Guide—L3_SIG

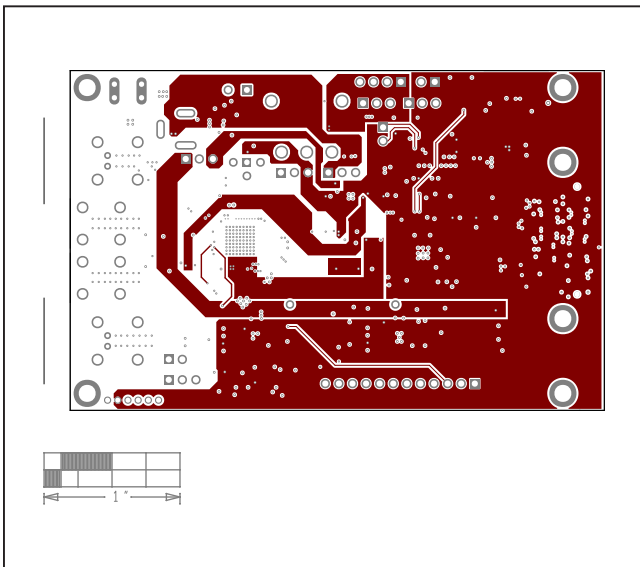
MAX96716 EV Kit PCB Layout Diagrams (continued)



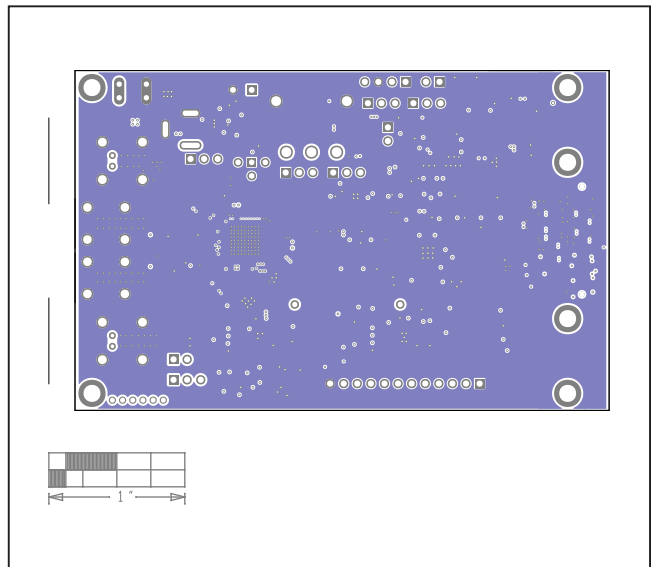
MAX96716 EV Kit Component Placement Guide—L4_GND



MAX96716 EV Kit Component Placement Guide—L5_PWR

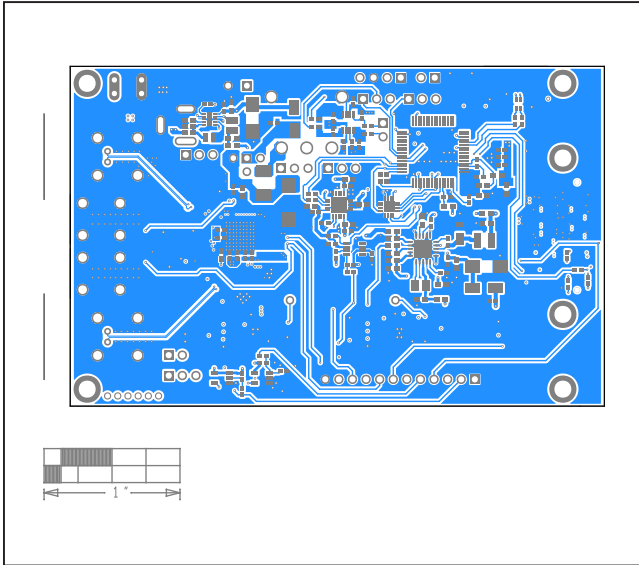


MAX96716 EV Kit Component Placement Guide—L6_SIG

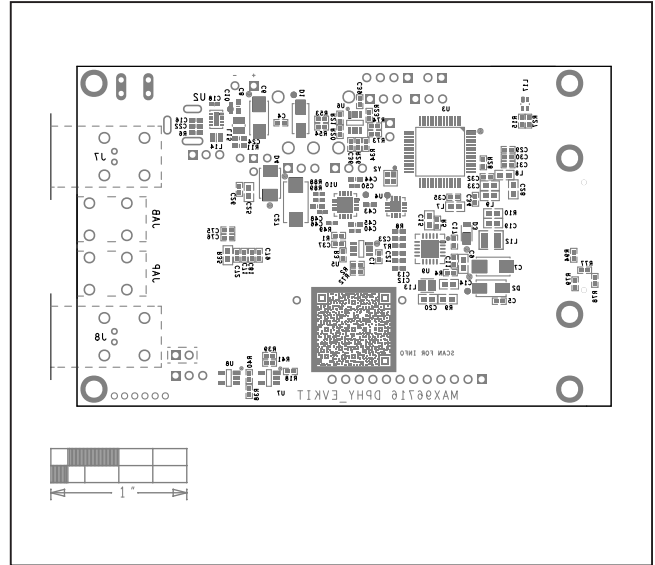


MAX96716 EV Kit Component Placement Guide—L7_GND

MAX96716 EV Kit PCB Layout Diagrams (continued)



MAX96716 EV Kit Component Placement Guide—Bottom



MAX96716 EV Kit Component Placement Guide—Bottom Silkscreen

Revision History

| REVISION NUMBER | REVISION DATE | DESCRIPTION | PAGES CHANGED |
|-----------------|---------------|-----------------|---------------|
| 0 | 2/24 | Initial release | — |



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