Rev: 122012

MAX24000-Series EVKIT
Evaluates: MAX24000-Series Clock Products

General Description

The MAX24000-Series EVKIT is an easy-to-use evaluation kit for the Microsemi MAX24000-Series clock synchronization and clock synthesis ICs. A surface-mounted IC device and careful layout provide maximum signal integrity. On-board crystal, XO and TCXO components are provided for use as the device reference clock. Additionally, the board can accept 3 external input clocks which are accessible via SMB connectors. All device output clocks are available via SMB connectors to allow easy evaluation of the device's jitter performance. The EVKIT can be configured to have four device GPIO pins connected to LEDs or header pins to provide device status information. Device JTAG I/O signals are also accessible via header pins. Finally, an on-board microcontroller and USB interface provide easy configuration and monitoring of the MAX24000-Series device via a Windows®-based software application.

This data sheet is for the revision B evaluation board assembly. Each board assembly revision has its own data sheet.

Evaluation Kit Contents

- MAX24000-series EVKIT Board
- Power Supply
- USB Cable
- 2 SMB to BNC cables
- 5 Oscillator Evaluation Daughter Cards

Features

- Soldered MAX24000-Series Device for Best Signal Integrity
- SMB Connectors For Easy Connectivity
- Connectors and Termination for Input Clock Signals
- On-Board Crystal, XO and TCXO Components for Use as Reference Clocks
- Footprints to Support Both 5x7mm and 3x5mm Oscillators
- External Oscillator Testing Support
- 4 Software Configurable Device Status LEDs and Header Pins
- Easy-to-Read Silkscreen Labels Identify the Signals Associated with All Connectors, Jumpers, and LEDs
- Windows®-Based Application Software Provides Easy GUI-Based Configuration and Monitoring of Most Common Device Features and Register Level Access to Entire Device Register Set
- Software Support for Creating and Running Configuration Scripts Saves Time During Evaluation and System Design

Minimum System Requirements

- PC Running Windows® XP or Windows® 7
- Display with 1024x768 Resolution or Higher
- Available USB Port

Ordering Information

PART NUMBER	DESCRIPTION
MAX24210EVKIT	Evaluation Kit for MAX24205 and MAX24210 5- or 10-Output Any-Rate Timing ICs
MAX24310EVKIT	Evaluation Kit for MAX24305 and MAX24310 5- or 10-Output Any-Rate Timing ICs with Internal EEPROM
MAX24410EVKIT	Evaluation Kit for MAX24405 and MAX24410 5- or 10-Output Any-Rate Clock Multipliers
MAX24510EVKIT	Evaluation Kit for MAX24505 and MAX24510 5- or 10-Output Any-Rate Clock Multipliers with Internal EEPROM
MAX24610EVKIT	Evaluation Kit for MAX24605 and MAX24610 5- or 10-Output Any-Rate Line Card Timing ICs
MAX24710EVKIT	Evaluation Kit for MAX24705 and MAX24710 5- or 10-Output Any-Rate Line Card Timing ICs with Internal EEPROM

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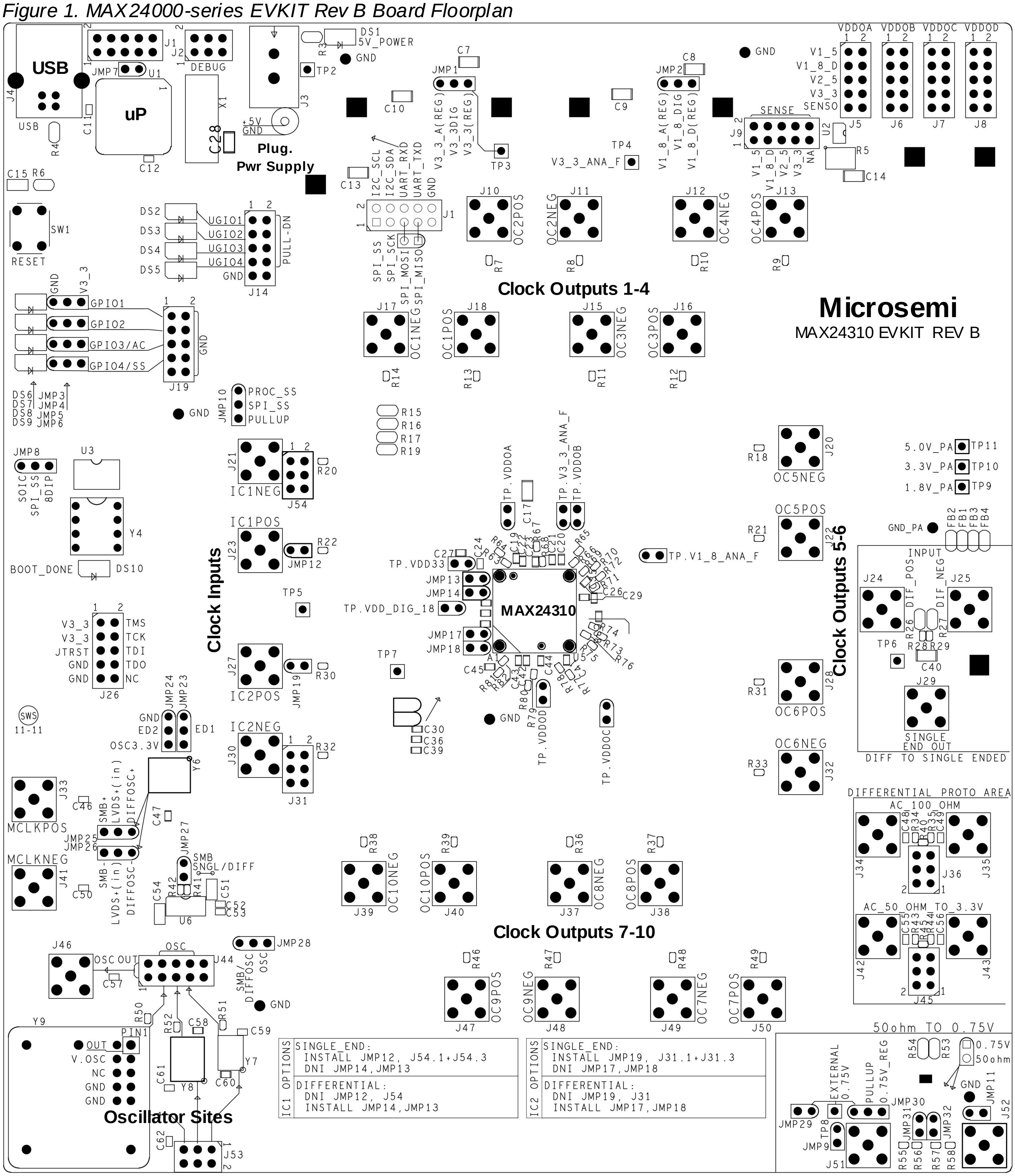
1. Overview

This document covers the revision B assembly of the MAX24000-series Evaluation Kit board.

2. Board Floorplan and Configuration

Figure 1. MAX24000-series EVKIT Rev B Board Floorplan



When the board is oriented as shown in Figure 1, the MAX24000-Series device is located in the middle of the board, the input clock connectors are on the left side, and the output clock connectors are above, to the right and below the device. USB and power supply connectors are located in the top left corner of the board.

2.1 Power Supply Connection

The EVKIT board is powered via connector J3 using the provided AC-wall-plug 5V power supply. LED DS1 illuminates to indicate that the board is powered.

2.2 USB Connection

The Windows®-based MAX24000-series EVKIT software communicates to the board via USB connector J4.

2.3 Hardware Configuration Settings

2.3.1 Power Supply

The EVKIT provides several options for evaluating device performance with respect to power supply configuration. Table 1 summarizes the EVKIT power supply related hardware connectors and functionality.

2.3.2 Reset and Microprocessor

The EVKIT provides a momentary switch reset button that can be used to perform a hardware reset of the board. Additionally, the board has a USB connector for interfacing the EVKIT's microcontroller to the host PC running the EVKIT software. Table 2 summarizes the EVKIT reset and microprocessor related hardware connectors and functionality.

2.3.3 Master Clock Oscillator

The EVKIT provides several options for driving the MAX24000-Series device's MCLKOSC input from either an on-board oscillator or an external source. Table 3 summarizes the EVKIT master clock oscillator related hardware configuration connectors and functionality. Table 4 summarizes how to configure the EVKIT jumpers to select each MCLKOSC source.

2.3.4 Input Clocks

The EVKIT IC1 and IC2 inputs can be configured to accept either a differential or single-ended signal. When configured as a differential input, that input can be configured as either AC coupled or DC coupled. Table 5 summaries the EVKIT input clock related hardware connectors and functionality. Table 6 summarizes how to configure the EVKIT jumpers for either a differential or single-ended input.

2.3.5 Output Clocks

The EVKIT supports evaluation of all MAX24000-Series device output clocks using SMB connectors. Table 7 summarizes the EVKIT output clock related hardware connectors.

The EVKIT MAX24xxx output clock termination circuits are shown on schematic sheet 11. Common termination options can be evaluated by populating the appropriate components. The EVKIT is provided with output clocks OC1P/N through OC8P/N configured as DC-coupled differential CML, OC9P/N and OC10P/N configured as dual single-ended CMOS.

Table 1. Power Supply Hardware Configuration

SILK SCREEN REFERENCE	DEVICE / FUNCTION	BASIC SETTING	SCHEMATIC PAGE	DESCRIPTION
J3	Power jack	Connected to 5V	3	5V power input
TP2	Testpoint		3	Testpoint for 5V power input
TP3	Testpoint		3	Testpoint for 3.3V supply V3_3
GND	Testpoint		3	Ground testpoints. Reference designators are not shown, GND designation is used instead
JMP1	3 pin jumper	2-3: V3_3DIG jumpered to V3_3	4	Selects source of device VDD33 power pin. This pin can be connected to the board's main 3.3V supply (V3_3) or to a separately regulated 3.3V supply for the device's APLLs and XO.
JMP2	3 pin jumper	2-3: V1_8_DIG jumpered to V1_8_D	5	Selects source of device VDD_18, VDD_DIG_18 and VDD_OC_18 power pins. These pins can be connected to a digital 1.8V supply (V1_8_D) or to a separately regulated 1.8V supply for the device's APLLs, XO and outputs.
J5 (VDDOA) J6 (VDDOB) J7 (VDDOC) J8 (VDDOD)	10 pin header, power selection	Jumper pins 7+8	6	One and only one of the following jumper placements should be used on each 10-pin header: 1-2 Connects VDDOx to V1.5 3-4 Connects VDDOx to V1.8Dig 5-6 Connects VDDOx to V2.5 7-8 Connects VDDOx to V3.3 9-10 VDDOx to VSENSO (see J9)
J9 (VSENSEO)	10 pin header, power selection with current measurement	Jumper pin 7+8	6	Used to power any of VDDO[A,B,C,D] when the VSENSO jumper position of J5,J6,J7 or J9 is selected. One and only one of the following jumper placements should be used: 1-2 Connects VSENSO to V1.5 3-4 Connects VSENSO to V1.8Dig 5-6 Connects VSENSO to V2.5 7-8 Connects VSENSO to V3.3 9-10 not used
TP.VDDOA	Power Testpoint		14	device VDDOA pin
TP.VDDOB	Power Testpoint		14	device VDDOB pin
TP.VDDOC	Power Testpoint		14	device VDDOC pin
TP.VDDOD	Power Testpoint		14	device VDDOD pin
TP.V1_8_ANA_F	Power Testpoint		14	device pins: VDD_APLL1_18, VDD_APLL2_18, VDD_XO_18, VDDIO[A,B,C,D]
TP.VDD_DIG_18	Power Testpoint		14	device pins: VDD_OC_18, VDD_DIG_18, VDD_18
TP.V3_3_ANA_F	Power Testpoint		14	device pins: VDD_APLL1_33, VDD_APLL2_33, VDD_XO_33
TP.VDD33	Power Testpoint		14	device VDD_33 pin

Table 2. Reset and Microprocessor Hardware Configuration

SILK SCREEN REFERENCE	DEVICE / FUNCTION	BASIC SETTING	SCHEMATIC PAGE	DESCRIPTION
J4	USB connector	Connected to PC	8	Connects EVKIT to host computer
J1	Bus Connector	Not used	8	Can be used to interact with an external PCB (as either data source or sink)
J14 + DS2,3,4,5	Test points + LED	Not used	8	User I/O pins on microcontroller
SW1	Reset	Not used	8	The PCB receives a power on reset, and subsequent reset is done using SW1.
J2	Debug	Not used	8	Background debug connector. Used to interface to debug pod part # USB-ML-12 from PE Micro

Table 3. Master Clock Oscillator Hardware Configuration

SILK SCREEN REFERENCE	DEVICE / FUNCTION	BASIC SETTING	SCHEMATIC PAGE	DESCRIPTION
J53	Header, Power	1-2	9	Provides power to oscillator sites 1-2 powers Y7 3-4 powers Y8 5-6 powers Y9
J44 J46	Header, SMB connector	7-8	9	Selects clock source for UB22 J44 3-4 selects Y9 J44 5-6 selects Y8 J44 7-8 selects Y7 J44 2-4 can be used to route Y7 or Y8 clock signal to SMB J46 J44 1-3, 2-4 can be used to route Y9 to SMB J46
JMP28	3 pin jumper	2-3	9	Selects source for device MCLKOSCP/N pins. This revision of the EVKIT does not support MCLKOSCP/N differential options Y6 and J33/J41, and single-ended option J33. JMP28 should always be set to positon 2-3.

Table 4. MCLKOSC Source Selection Jumper Settings

MCLKOSC Source	Jumper Settings
Y6 On-board 5x7 Differential Oscillator Site	This revision of the EVKIT does not support this option.
Y7 On-board 3x5 Single-ended Oscillator Site	JMP28 = 2-3 J44 = 7-8 J53 = 1-2
Y8 On-board 5x7 Single-ended Oscillator Site	JMP28 = 2-3 J44 = 5-6 J53 = 3-4
Y9 Oscillator Daughter Card Site	JMP28 = 2-3 J44 = 3-4 J53 = 5-6
J33 External Single-ended Input	This revision of the EVKIT does not support this option.
J33/J41 External Differential Input	This revision of the EVKIT does not support this option.
Not Used	JMP28 = 2-3 J44 = Not Installed J53 = Not Installed

Table 5. Input Clock Hardware Configuration

SILK SCREEN REFERENCE	DEVICE / FUNCTION	BASIC SETTING	SCHEMATIC PAGE	DESCRIPTION
J22 J21	IC1POS IC1NEG		10	IC1 differential or single-ended input
JMP12 J54 JMP13 JMP14	IC1 configuration	Differential, AC Coupled: JMP12 Not Installed J54 = 5-6 JMP13 Installed JMP14 Installed	10	Used to configure IC1 as a differential or single-ended input, AC coupled or DC coupled. Refer to Table 6 for configuration options.
J27 J30	IC2POS IC2NEG		10	IC2 differential or single-ended input
JMP19 J31 JMP17 JMP18	IC2 configuratoin	Differential, AC Coupled: JMP19 Not Installed J31 = 5-6 JMP17 Installed JMP18 Installed	10	Used to configure IC2 as a differential or single-ended input, AC coupled or DC coupled. Refer to Table 6 for configuration options.

Table 6. Input Clock Differential/Single-Ended Mode Selection Jumper Settings

Input Clock	Mode	Coupling	Jumper Settings
IC1	Differential	AC	JMP12 = Not Installed J54 = 5-6 JMP13 = Installed JMP14 = Installed
		DC	JMP12 = Installed J54 = 1-2 JMP13 = Installed JMP14 = Installed
	Single-ended	AC	JMP12 = Not Installed J54 = 1-3 JMP13 = Not Installed JMP14 = Not Installed
		DC	JMP12 = Installed J54 = 1-3 JMP13 = Not Installed JMP14 = Not Installed
IC2	Differential	AC	JMP19 = Not Installed J31 = 5-6 JMP17 = Installed JMP18 = Installed
		DC	JMP19 = Installed J31 = 1-2 JMP17 = Installed JMP18 = Installed
	Single-ended	AC	JMP19 = Not Installed J31 = 1-3 JMP17 = Not Installed JMP18 = Not Installed
		DC	JMP19 = Installed J31 = 1-3 JMP17 = Not Installed JMP18 = Not Installed

Table 7. Output Clock Hardware Configuration

SILK SCREEN REFERENCE	DEVICE / FUNCTION	BASIC SETTING	SCHEMATIC PAGE	DESCRIPTION
J17 J18 J15 J16	OC1 Output OC2 Output		11	Output clocks, referenced to VDDOA
J11 J10 J12 J13 J20 J22	OC3 Output OC4 Output OC5 Output		11	Output clocks, referenced to VDDOB
J32 J28 J49 J50 J37 J38	OC6 Output OC7 Output OC8 Output		11	Output clocks, referenced to VDDOC
J48 J47 J39 J40	OC9 Output OC10 Output		11	Output clocks, referenced to VDDOD

2.4 GPIO Header and Status LEDs

The device's bi-directional GPIO pins are available on the 10-pin header J19. The header pins are labeled for easy identification. The present states of GPIO1 through GPIO4 are indicated by LEDs DS6 through DS9, respectively.

2.5 Power-up Configuration from Internal/External EEPROM

The MAX24000-Series clock synchronization and clock synthesis devices support loading a device configuration from an EEPROM following a hardware reset. Depending on the part number, this EEPROM can be inside the device or external. Refer to the Ordering Information table on page 1 and the device data sheets for details.

The MAX24000-Series EVKIT supports evaluating this feature on all devices in the MAX24000-Series family. For devices that use an external EEPROM two options are provided. Refer to Table 8 for details. For devices with an internal EEPROM this EVKIT functionality is not used.

Table 8. MAX24000-Series EVKIT External EEPROM Options

Option	JMP8
On-board 2048 Byte SOIC EEPROM	1-2 (SOIC)
8-Pin DIP Socket	2-3 (8-DIP)

The MAX24000-Series EVKIT software can be used to program the EEPROM based on the current GUI configuration, or from a file. Additionally, the EVKIT software can be used to save the current GUI configuration to a file that can be used to program the EEPROM with a third-party tool.

Following a hardware reset, the device configuration stored in EEPROM is loaded into the device if the device pin GPIO3/AC is high. This pin has an internal pull-up resistor. Consequently, if the pin is left floating the EEPROM configuration will be loaded following a hardware reset. Placing a jumper across header J19 pins 5 and 6 will hold GPIO3/AC low during reset and prevent the EEPROM configuration from being loaded.

2.6 JTAG Header

The device JTAG interface is available on the 10-pin header J26. The header pins are labeled with the corresponding JTAG signal names for easy identification.

3. Software Installation

EVKIT software installation consists of the following two steps:

1. Install the EVKIT software application
2. Install the EVKIT virtual COM port driver (for USB connection to the board)

The following sections describe in detail how to perform each of these steps.

3.1 Software Application Installation

At this time the EVKIT software is only supported on Windows® XP and Windows® 7 operating systems. To install the software, open the installer zip file and run **setup.exe**.

The EVKIT software requires Microsoft .NET Framework 4.0 to operate. When setup.exe is run, it checks to see if .NET 4.0 is installed on the target computer. If .NET 4.0 is not already installed, the user is prompted to download and install .NET 4.0 from Microsoft's website.

3.2 USB Virtual COM Port Device Driver Installation

After the GUI application has been installed on the PC, apply power to the EVKIT board and connect its USB port to a USB port of the PC. Then follow these steps:

- A "Found New Hardware" message will appear in the notification area of the Windows taskbar, and then the Found New Hardware Wizard will appear.
- Select **No** when asked if you want to connect to Windows Update to look for the driver.
- Click **Next**.
- Select **Install from a list or specific location.**
- Click **Next**.
- Select **Search for the best driver in these locations** and check **include this location in the search** then browse to the folder where the software was installed. The default installation folder can be reach by browsing:
  Windows XP: My Computer → Program Files → Microsemi → MAX24000-Series EVKIT
  Windows 7: Computer → Local Disk (C:) → Program Files (x86) →Microsemi →
  MAX24000-Series EVKIT
  Within this directory select the sub-directory **USB Driver**. The driver file is: Freescale_CDC_Driver_CMX_WIN7.inf, but Windows only needs to know the name of the folder in which to look for this file.
- Click **Next**.
- If a message appears indicating the software has not passed logo testing, click **Continue Anyway**.

That should complete the virtual COM port device driver installation. After following these steps, the EVKIT software should be ready to communicate with the board.

3.3 Command Line Options

The software has these command line options:

-l <filepath> specifies an alternate log file. Example: MAX24000SeriesEVKIT.exe –l "mylog.mfg"

To add command line options to the EVKIT shortcut that the installer adds to the desktop or the start menu, right-click on the shortcut and select **Properties**. In the **Shortcut** tab, at the end of the text in the **Target** textbox, add a space followed by the command line option.

4. Software Application Overview

The EVKIT software provides an easy and interactive way to evaluate the MAX24000-Series clock synchronization and clock synthesis devices by using hierarchical menus to configure the device and monitor its status. The following sections briefly describe each of the major application menus.

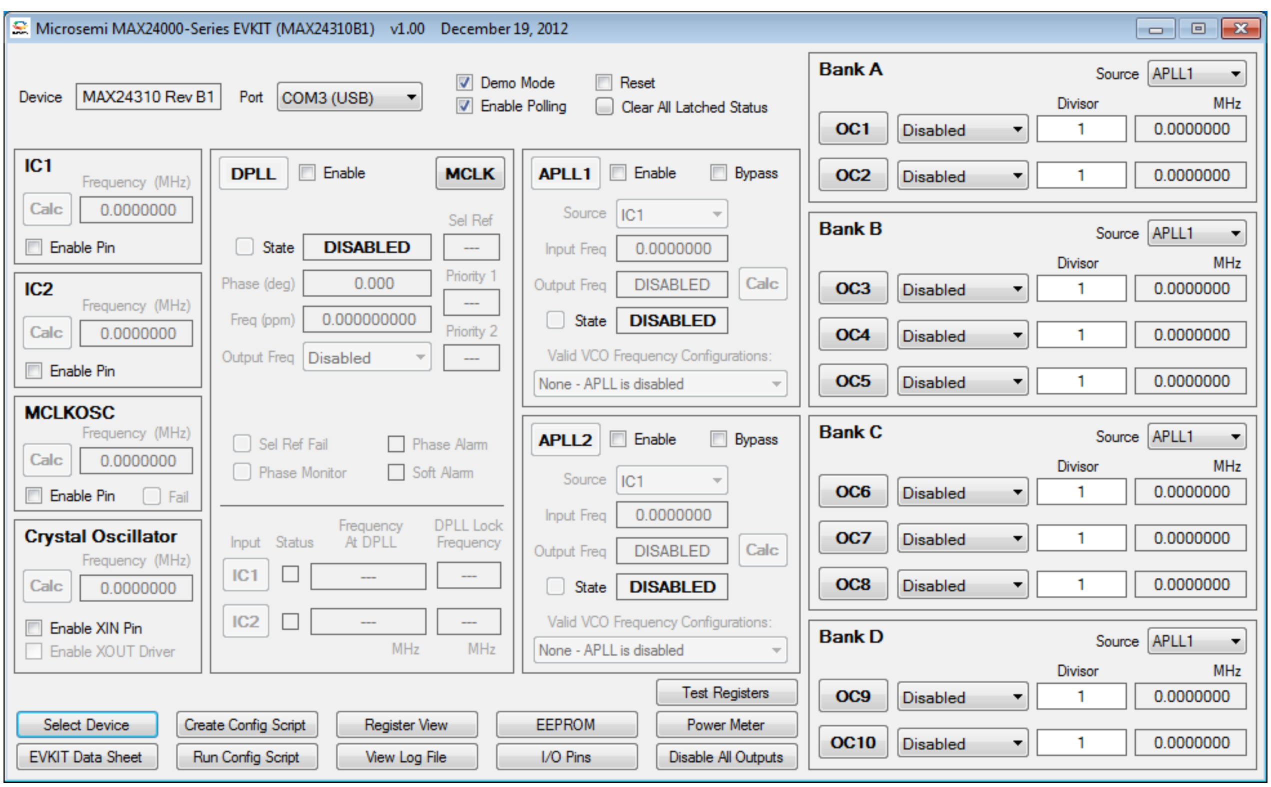
Note: in each menu, when the mouse cursor is placed over a configuration or status field, more information is displayed about that field such as the associated device register(s), valid numerical range, or error information.

4.1 Main Menu

A customized main menu is displayed for each MAX24000-Series device. The **Select Device** button in the lower left corner of the menu can be used to select a specific device in the MAX24000-Series family.

The EVKIT main menu for the MAX24310 revA1 is shown in Figure 2. This menu provides an overview of the MAX24310A1 configuration and status. Additionally, it provides access to the application sub-menus that are used to perform detailed device configuration.

Figure 2. EVKIT Software Main Menu - MAX24310 Rev B1



The major features located on the main menu are:

- **Port** list (top left)

  When the program starts, a scan is performed of the computer's USB-connected virtual COM ports. Those ports connected to a MAX24000-Series EVKIT are displayed in the port list.

- **Demo Mode** checkbox (top center)

  When the program starts, it is initially in Demo Mode. In Demo Mode the software is not connected to the EVKIT board. In this mode, the software can be used to investigate device configuration options. Additionally, demo mode can be used to develop a device configuration script or EEPROM configuration file. The EVKIT can be operated in demo without the need to connect a board.

  When the **Demo Mode** checkbox is unchecked, the EVKIT software establishes communication with the EVKIT board through the port displayed in the **Port** box. In this mode all menu configuration changes are translated into register settings which are written to the device on the EVKIT board via the USB interface.

- **Enable Polling** checkbox (top center)

  While the **Demo Mode** checkbox is unchecked, if the **Enable Polling** checkbox is checked, the status registers in the device are periodically polled, and the corresponding status fields in the GUI are automatically updated. While the **Enable Polling** checkbox is unchecked, device polling is suspended.

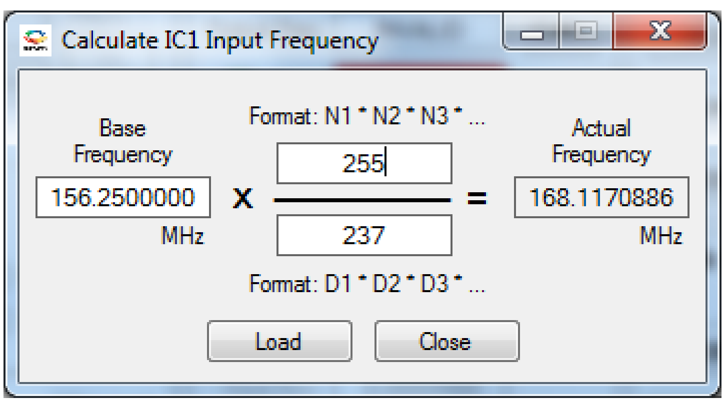
- **Reset** checkbox (top center)

  This checkbox directly controls the MCR1.RST bit in the device. When this box is checked the entire device is reset to its power-on default state. If GPIO3/AC pin is high when reset is de-asserted, the device automatically configures its registers from internal or external EEPROM (depending on device part number).

- **Input Clocks, Master Clock Oscillator, and Crystal Oscillator**

  The IC1, IC2, MCLKOSC, and Crystal Oscillator sections on the main menu are used enable these inputs and specify the signal frequency at the device pin. Simple frequencies such as 156.25MHz can be entered directly in the **Frequency** edit box. Pressing the **Calc** button launches a sub-menu similar to the one shown in Figure 3. This menu can be used to specify more complex frequencies such as 156.25MHz * (255 / 237). In this menu, the nominal frequency numerator and denominator multiplier values can be entered as either simple integer values or as a string of multiplied integer values.

Figure 3. Input Clock Frequency Calculator Menu



- **APLL1 and APLL2**

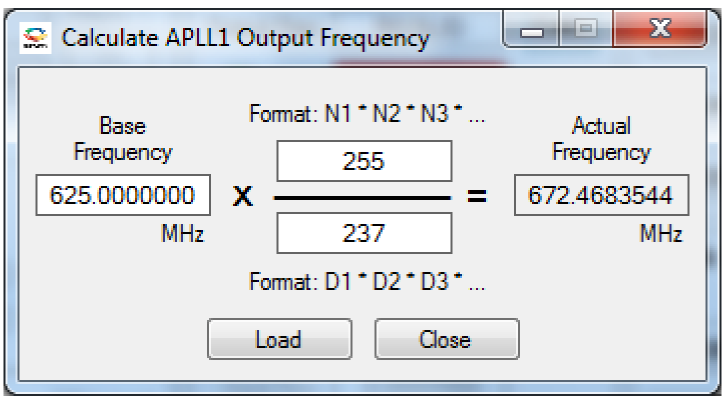
  The MAX24000-Series devices have two independently configurable APLLs. Initially, the APLLs are disabled. The EVKIT software indicates this status by disabling the **APLLn** sub-menu button and the APLL fields on the main menu. An APLL is enabled by checking its **Enable** check box on the main menu.

  The APLL input frequency is automatically determined from the APLL source selected. For output frequency, simple frequencies such as 625MHz can be entered directly in the main menu edit box. Pressing the **Calc** button launches a sub-menu similar to the one shown in Figure 4. This menu can be used to specify more complex frequencies such as 625MHz * (255 / 237).

  From the specified input and output frequencies, the EVKIT software determines a list of valid configuration options and lists them in the **Valid VCO Frequency Configurations** list box. In addition the EVKIT software configures the APLL to the first option in the list. For most applications, the first setting in the list is the optimal configuration.

  Pressing the **APLLn** button launches a sub-menu that can be used to configure the APLL manually. This menu can be used for detailed custom configuration of an APLL or to see the detailed settings the EVKIT software chose when configuring the APLL from the main menu.

Figure 4. APLL1 Output Frequency Calculator Menu



- **Output Clocks, Bank A through Bank D**

  The MAX24000-Series device output clocks are divided into four banks. These banks and their associated output clocks are shown on the right side of the main menu. The source, signal format, and APLL divisor for each output clock can be specified on the main menu. Additionally, the frequency of each output clock is displayed on the main menu. The **OCn** button launches a sub-menu with additional configuration options.

- **Select Device**

  This button launches a pop-up menu that can be used to select a specific MAX24000-Series device. When a new device is selected, the EVKIT software is customized to match that device's features and internal resources.

- **User Guide**

  Pressing the **User Guide** button launches Adobe Acrobat Reader and opens a copy of the MAX24000-Series EVKIT data sheet (this document). Adobe Acrobat Reader must be installed for this function to work.

- **Create Config Script**

  The **Create Config Script** button launches a sub-menu that can be used to save the current GUI configuration to a file. This file is an ASCII text file that contains the sequence of device register writes required to configure the device to match the GUI settings. Certain aspects of configuring the device require a specific initialization sequence. The configuration script created using the **Create Config Script** menu adheres to those requirements.

- **Run Config Script**

  The **Run Config Script** button launches a sub-menu that can be used to execute a device configuration script.

- **Register View**

  The **Register View** button launches a sub-menu that provides register-level access to all device registers.

- **View Log File**

  The **View Log File** button launches a text editor containing the EVKIT software log file. This log file contains the history of all devices register writes performed since the application was launched.

- **EEPROM**

  The **EEPROM** button launches a sub-menu that can be used to perform EEPROM related operations. This menu can be used to save the current GUI configuration to an EEPROM configuration file for later use by either the EVKIT software or a third-party tool. Additionally, this menu can be used to program the EVKIT EEPROM with either the current GUI configuration or an EEPROM configuration file.

- **I/O Pins**

  The **I/O Pins** button launches a sub-menu that can be used to configure the device GPIO pin functionality.

- **Power Meter**

  The **Power Meter** button launches a sub-menu that displays the device estimated and measured power consumption. Esitmated power mode can be used in either demo mode or while communicating with an EVKIT board. Estimated power is based on data sheet typical and max ratings. Measured power is based on voltage and current measurements taken by the EVKIT board. Measured power mode can only be used while the EVKIT is communicating with an EVKIT board.

  Note: This measured power mode only reports accurate numbers when board headers J5, J6, J7 and J8 all have jumpers in the SENSO position and header J9 has a jumper in a position other than “NA”. This combination of jumper settings forces all VDDOA through VDDOD power supply voltages to be the single voltage specified by the jumper on header J9. Therefore this feature cannot be used for all possible device configurations.

- **Disable All Outputs**

  Pressing the **Disable All Outputs** button disables all device outputs.

- **DPLL**

  This section of the main menu is only displayed for members of the MAX24000-Series devices that contain a DPLL.

  Initially, the DPLL section of the main menu is disabled. The EVKIT indicates this status by disabling the **DPLL** sub-menu button and the DPLL fields on the main menu. The DPLL is enabled by checking its **Enable** check box on the main menu.

  Prior to enabling the DPLL, its master clock must be configured. This is accomplished by clicking the **MCLK** button and configuring the fields of the DPLL Master Clock sub-menu. Refer to section 4.4 for details.

The DPLL **State**, **Sel Ref Fail**, and **Phase Monitor** buttons represent latched status bits in the device. When the button is red, the corresponding latched status bit has been set in the device since the last time the button was pressed. Pressing the button clears the latched status bit and changes the color of the button back to green. The **State** button indicates the state of the DPLL has changed. **Sel Ref Fail** indicates the selected reference has failed. **Phase Monitor** indicates the phase monitor limit has been exceeded. The DPLL **State, Phase, Freq, Sel Ref**, **Priority 1**, and **Priority 2** text boxes display the real-time status of the corresponding device register fields.

The lower portion of the DPLL section of the main menu has fields for the device Input Clock Block. Each input clock Status LED displays the real-time status of the input clock as reported by its input monitor. When the input clock is disabled, the LED is grey. When the input clock is enabled, the LED provides a color-coded status of the input clock's state. When a clock of the correct frequency is applied to an input, the associated LED turns yellow when activity is detected and green when the input clock frequency is found to be within range. If an input is disqualified because the DPLL could not lock to it, the LED turns magenta.

Pressing the **DPLL** button launches a sub-menu that can be used to configure the DPLL. Pressing the **IC1** or **IC2** button launches a sub-menu that can be used to configure input monitoring, scaling and dividing for the corresponding input clock.

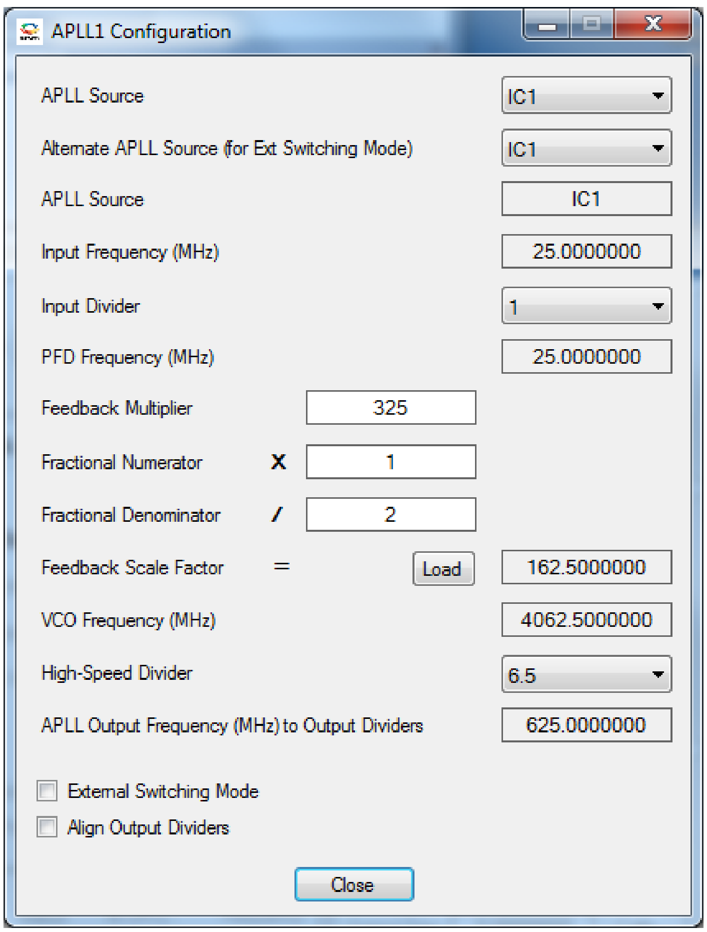
4.2 APLL Configuration Menu

The APLL Configuration sub-menu shown in Figure 5 is accessed by pressing the **APLL1** button or the **APLL2** button on the main menu. This menu can be used for detailed custom configuration of an APLL or to see the detailed settings the EVKIT software chose when configuring the APLL from the main menu.

As shown in Figure 5, each of the Feedback Scale Factor terms (Feedback Multiplier, Fractional Numerator, and Fractional Denominator) can be entered as either simple integer values or as a string of multiplied integer values. Whenever one or more of these fields is change the software colors the **Load** button red to remind the user that the **Feedback Scale Factor** field is not updated until the button is clicked.

In this menu an APLL can be configured for pin-based input reference selection on the GPIO4/SS pin by checking the **External Switching Mode** checkbox and specifying the two references to switch between in the **APLL Source** and **Alternate APLL Source** fields.

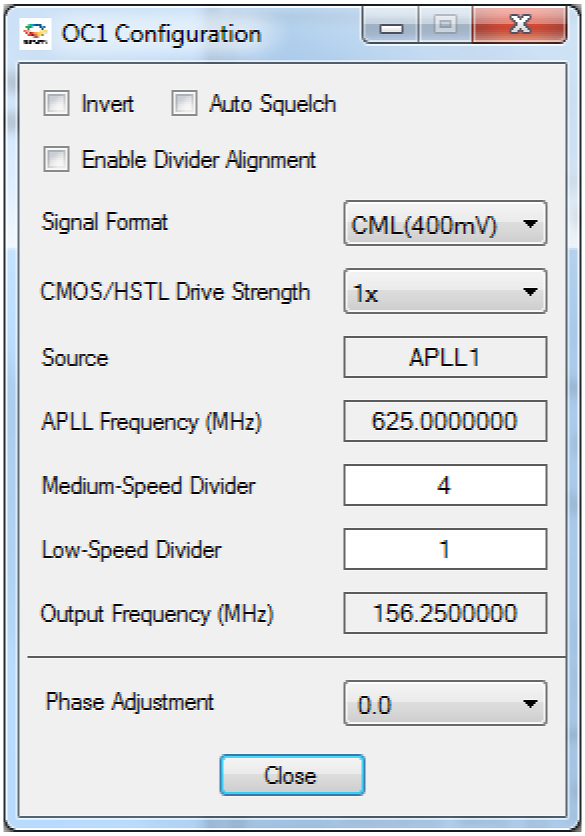
Figure 5. APLL1 Configuration Menu



4.3 Output Clock Configuration Menu

The Output Clock Configuration sub-menu shown in Figure 6 is accessed by pressing the corresponding **OCn** button on the main menu. This menu is used to configure the output clock signal format and divider values that control the frequency of the clock at the pin.

Figure 6. Output Clock Configuration Menu



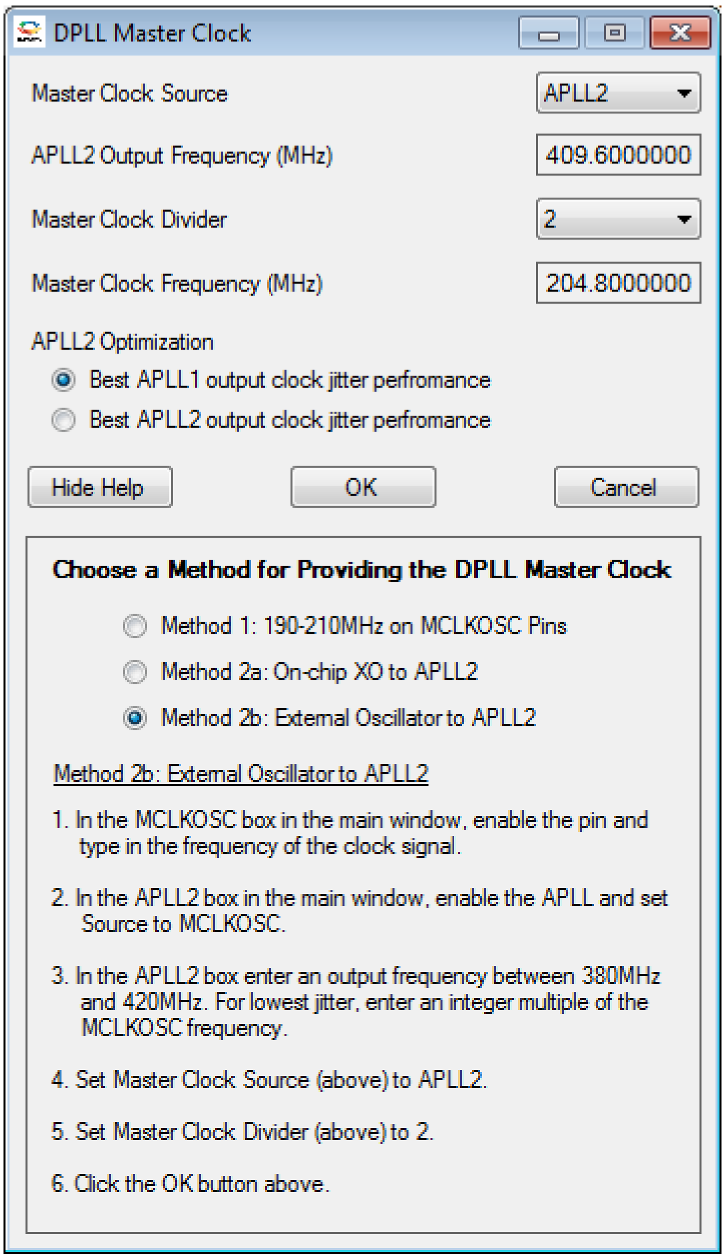
4.4 DPLL Master Clock Configuration Menu

This sub-menu is only available for MAX24000-Series devices that contain a DPLL.

The DPLL master clock configuration sub-menu shown in Figure 7 is accessed by pressing the **MCLK** button on the main menu. The DPLL master clock can be either sourced directly from the MCLKOSC pins or synthesized by APLL2 from an input source. This menu is used to specify the source and configure that source to a valid master clock frequency. Once the DPLL master clock configuration is selected, press the **OK** button to initialize the DPLL master clock.

The DPLL master clock supports three methods of configuration. These methods, as well as simple step-by-step configuration instructions, are shown in the Help section at the bottom of the menu. Each set of instructions is displayed by selecting the corresponding method's radio button.

Figure 7. DPLL Master Clock Configuration Menu

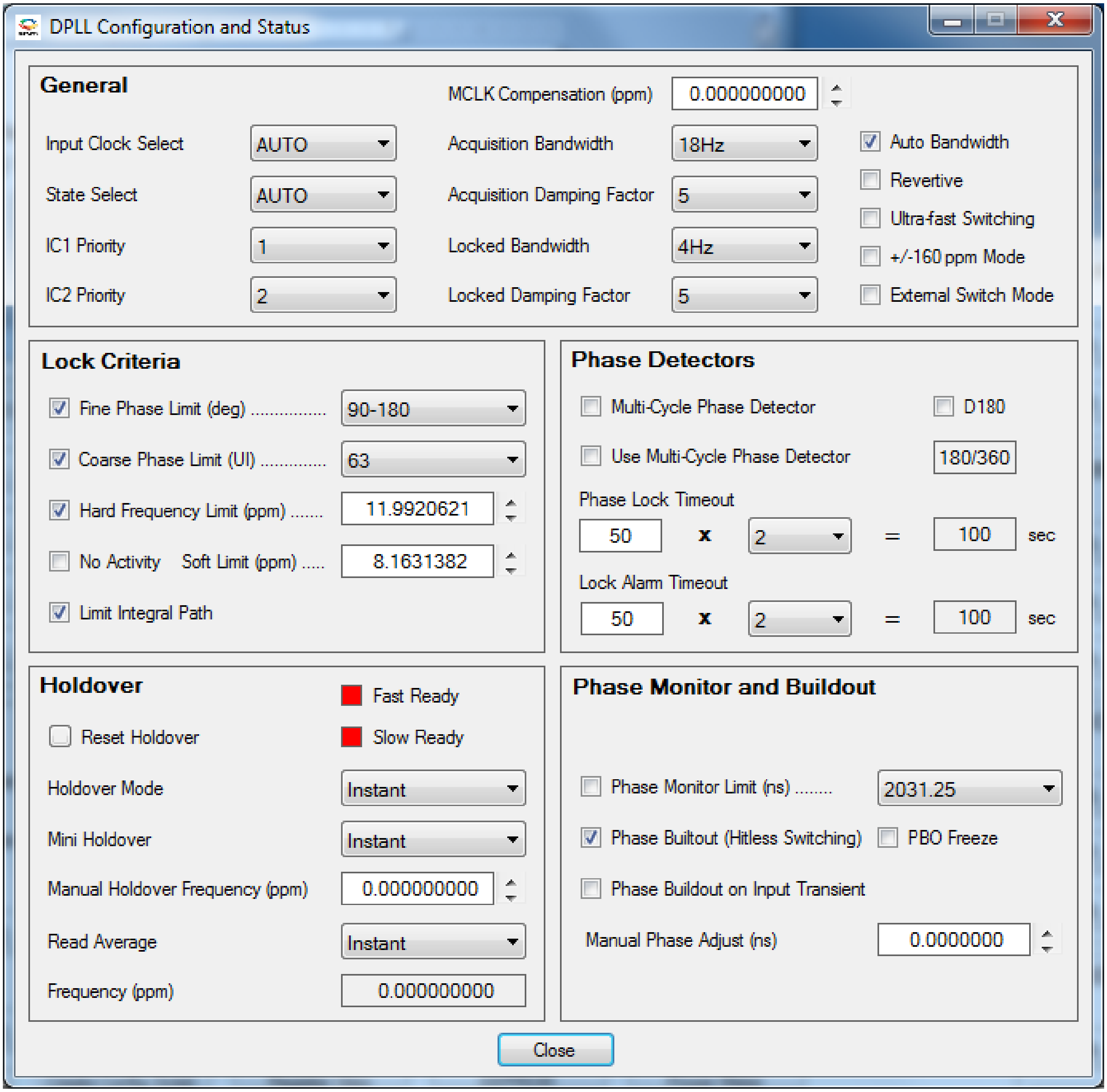


4.5 DPLL Configuration Menu

This sub-menu is only available for MAX24000-Series devices that contain a DPLL.

The DPLL configuration sub-menu shown in Figure 8 is accessed by pressing the **DPLL** button on the main menu. This menu is used to perform detailed configuration of the DPLL including specifying the DPLL bandwidths, holdover mode, lock criteria, phase detector, and phase buildout functionality.

Figure 8. DPLL Configuration Menu

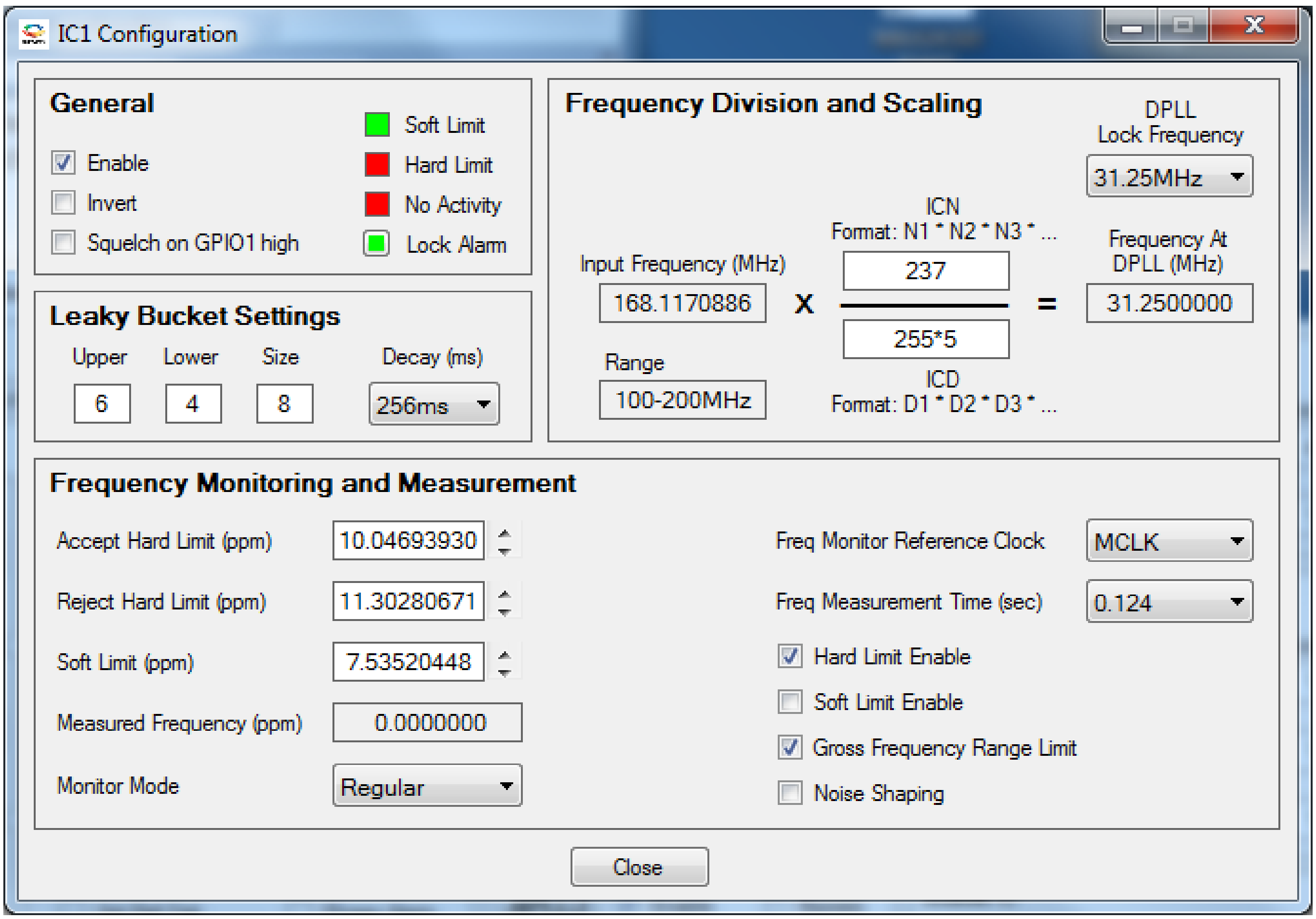


4.6 DPLL Input Clock Configuration Menu

This sub-menu is only available for MAX24000-Series devices that contain a DPLL.

The input clock configuration sub-menu shown in Figure 9 can be accessed by pressing the corresponding **ICn** button on the main menu. This menu is used to perform detailed configuration of input clock functionality related to DPLL operation. This configuration includes enabling the input clock path to the DPLL, specifying the DPLL lock frequency to use for the input clock, and specifying the divider ratio to be used to divide the input clock to the lock frequency. This menu can also be used to configure the input clock monitoring parameters.

Figure 9. DPLL Input Clock Configuration Menu



4.7 Power Meter Menu

The power meter sub-menu is accessed by pressing the **Power Meter** button on the main menu. The power meter has two modes of operation – Estimated and Measured.

Estimated mode**,** shown in Figure 10 below, is selected by pressing the **Estimated** button in the top left corner of the Power Meter menu. In estimate mode, the EVKIT software calculates both the typical and maximum device current and power based on the enabled functionality and device data sheet specs. This mode is available in both Demo Mode and while the EVKIT software is communicating with an EVKIT board.

Measured mode, shown in Figure 11 below, is selected by pressing the Measured button in the top left corner of the Power Meter menu. In measured mode, the EVKIT software periodically measures the current of the device on the EVKIT and displays this information along with the corresponding calculated supply power and total device power. This information can be used to estimate the typical device power consumption for a specific device configuration. Measured mode is only available while the EVKIT software is communicating with an EVKIT board.

Note: This feature only reports accurate numbers when board headers J5, J6, J7 and J8 all have jumpers in the SENSO position and header J9 has a jumper in a position other than "NA". This combination of jumper settings forces all VDDOA through VDDOD power supply voltages to be the single voltage specified by the jumper on header J9. Therefore this feature cannot be used for all possible device configurations.

Figure 10. Power Meter Menu, Estimated Mode

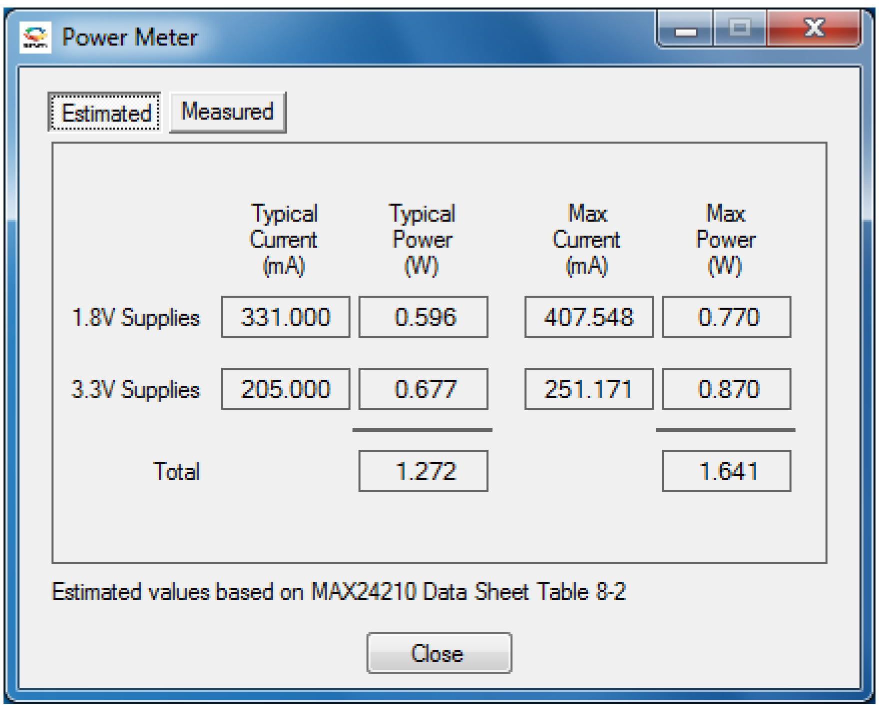
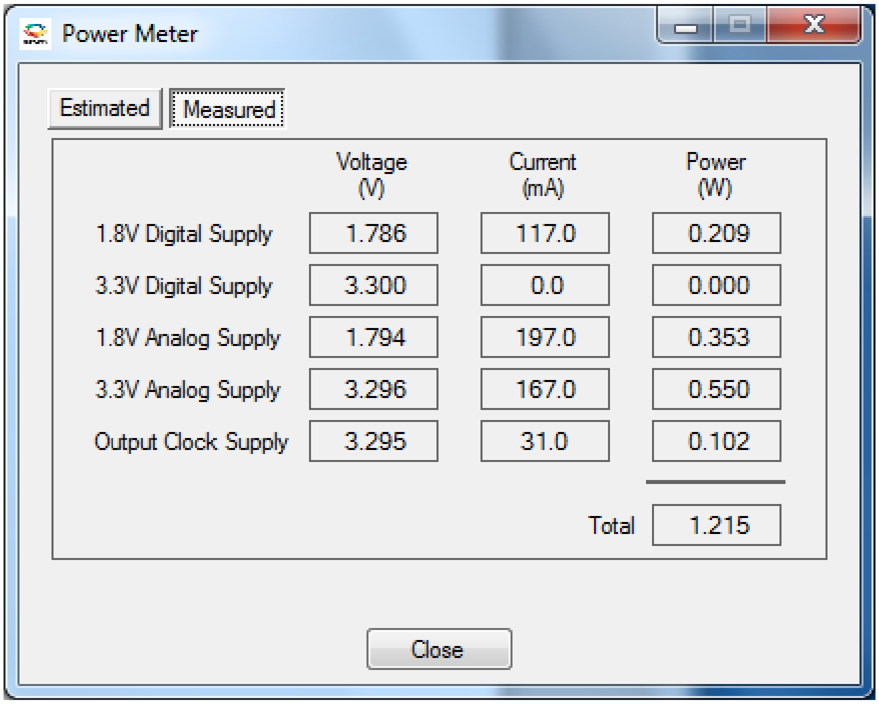


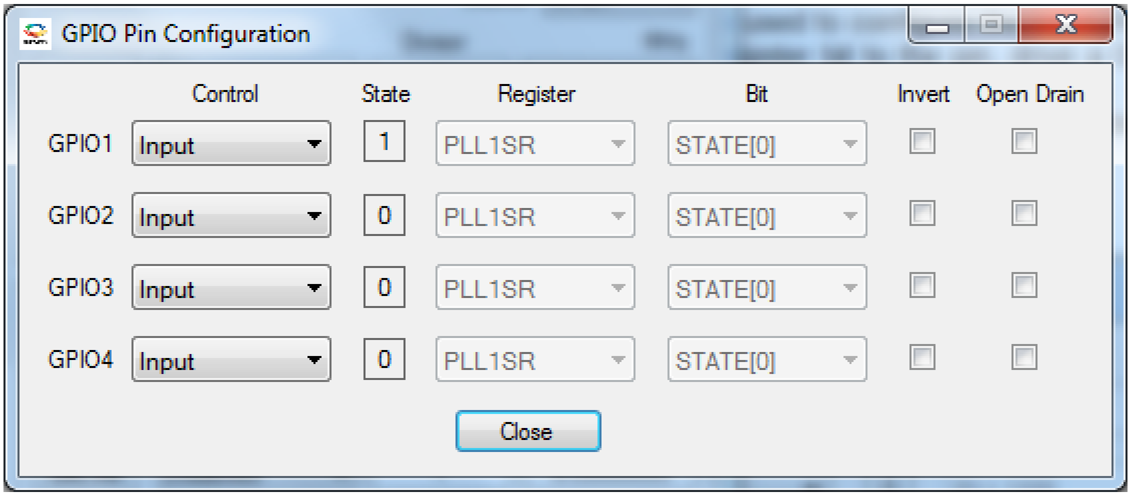
Figure 11. Power Meter Menu, Measured Mode



4.8 I/O Pin Configuration Menu

The I/O Pin Configuration sub-menu shown in Figure 12 is accessed by pressing the **I/O Pins** button on the main menu. This menu is used to configure device's four GPIO pins. Each I/O pin can be configured to map a device status register bit to the pin, drive a 0 or 1, or be an input pin. Additionally this menu can be used to configure the output to be inverted or open-drain. Output signal inversion can only be applied to a GPIO pin that is configured to output the state of a status register bit.

Figure 12. I/O Pin Configuration Menu

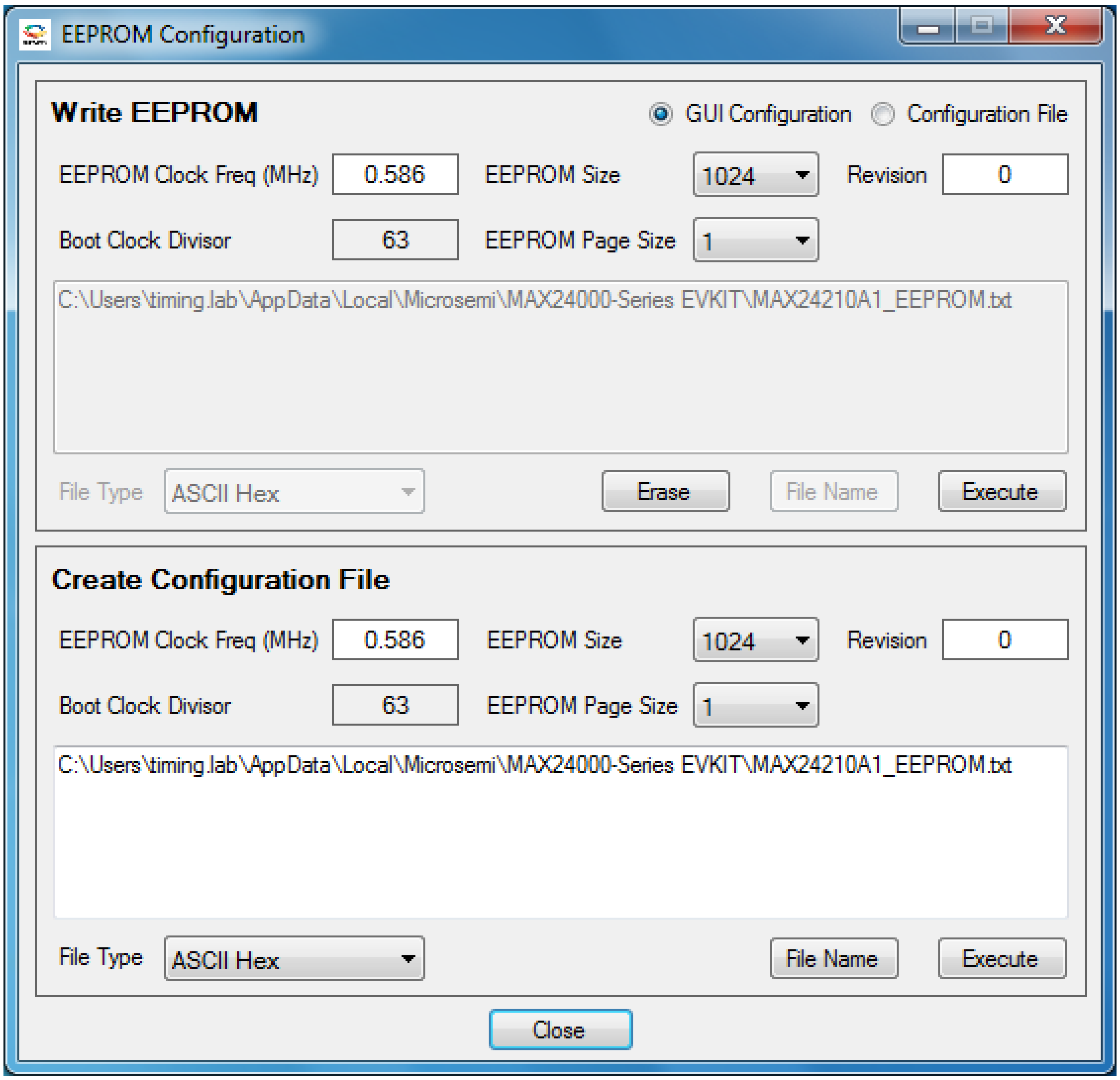


4.9 EEPROM Menu

The EEPROM sub-menu shown in Figure 13 is accessed by pressing the **EEPROM** button on the main menu. This menu can be used to save the current GUI configuration to an EEPROM configuration file for later use by either the EVKIT software or a third-party tool. Additionally, this menu can be used to program the EVKIT EEPROM with either the current GUI configuration or an EEPROM configuration file.

The EVKIT software must be connected to an EVKIT board and not be in demo mode to program the EEPROM. However, an EEPROM configuration file can be created in demo mode or when connected to an EVKIT board.

Figure 13. EEPROM Menu



4.10 Register View Menu

When the main menu Register View button is pressed, the Register View window shown in Figure 14 is launched. This window can be used to view and edit the entire device register set.

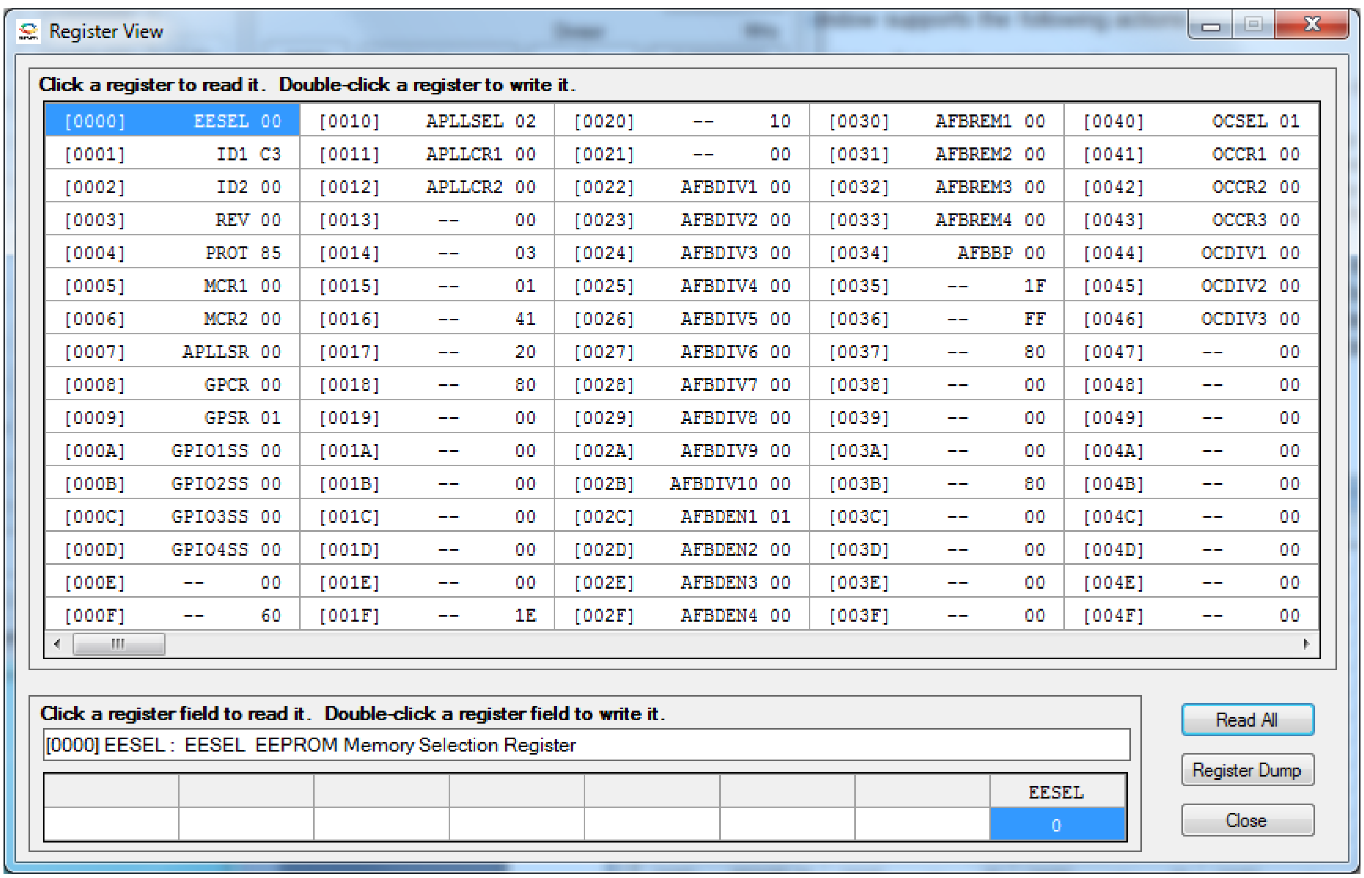
The large grid that takes up most of the window displays the device register map. For each register, its hexadecimal address in square brackets is followed by its register name and its contents in two-digit hex format. When a register is clicked in the main register grid, its register description and fields are displayed at the bottom of the window.

The Register View window supports the following actions:

- **Read a register.** Select the register in the register map.
- **Read a register field.** Select the register in the map or the register field at the bottom of the window.
- **Read all registers.** Press the **Read All** button.
- **Write a register.** Double-click the register name in the register map and enter the value to be written.
- **Write a register field.** Select the register, double-click the field, and enter the value to be written.
- **Write a multi-register field.** Double-click one of the register names and enter the value for the field.
- **Write a complete device register dump to a text file.** Press the **Register Dump** button.

When using the Register View window it is important to remember that APLL, output clock, and input clock registers are bank-switched by the APLLSEL (0x0010), OCSEL (0x00C0), and ICSEL (0x0050) registers, respectively. Refer to the device data sheet register map for more details. It is also important to remember that all DPLL and Input Clock Block registers are only accessible if these blocks have been provided a valid master clock.

Figure 14. Register View Menu



4.11 Configuration Scripts and Log Files

4.11.1 Configuration Log File

Every write command issued by the software to the EVKIT board is logged in a file. The file naming convention for the default log file name is [DEVICE][REV]_EVKIT_Log.mfg. The default location of the log file is the application data directory specified when the EVKIT software is installed. As an example, if the default application data directory is chosen when the EVKIT software is installed and the selected device is a MAX24310 revA1, the corresponding log file would be:

Windows XP:

> C:\Documents and Settings\All Users\Application Data\Microsemi\MAX24000-Series EVKIT\MAX24310A1_EVKIT_Log.mfg

Windows 7:

> C:\Users\<USER_NAME>\AppData\Local\Microsemi\MAX24000-Series EVKIT\MAX24310A1_EVKIT_Log.mfg

The log file can be viewed in Notepad by pressing the Log File button in the lower-left corner of the main window.

Command line option "-l <filepath>" can be used to change the log file name and location.

4.11.2 Configuration Scripts

Configuration scripts are useful for quickly configuring a device without having to remember all the required settings. Two types of configuration scripts are possible: full and partial. A full configuration script contains register writes for all configuration registers in the device. A partial configuration script contains register writes for only those registers that have been changed from their reset values. A partial configuration script can be used to initialize a device following reset using the minimum number of device accesses.

Certain aspects of configuring a MAX24000-Series device require a specific initialization sequence. The configuration scripts created using the **Create Config Script** menu adhere to those requirements.

4.11.2.1 Device Initialization Script

The device initialization script contains an application independent device configuration that optimizes device performance. Each MAX24000-Series device has a unique initialization script file. This script should be loaded as the first step in device configuration as described in the following sections. The initialization script file name is [DEVICE][REVISION]_Startup.mfg (where [DEVICE] indicates device part number and [REVISION] indicates device revision. All device startup configuration scripts are located in the application data directory in the sub-directory Scripts\Startup Scripts. As an example, the initialization script file for the MAX24310 revA1 is:

Windows XP:

> C:\Documents and Settings\All Users\Application Data\Microsemi\24000-Series EVKIT\Scripts\Startup Scripts\MAX24310A1_Startup.mfg

Windows 7:

> C:\Users\<USER_NAME>\AppData\Local\Microsemi\MAX24000-Series EVKIT\Scripts\Startup Scripts\MAX24310A1_Startup.mfg

The startup configuration script can be edited or replaced as needed to change the initial configuration of the device. Be aware, however, that the section of the file labeled “Required Initialization” must be executed after device power-up or reset for the device to operate correctly.

4.11.2.2 Creating a Full Configuration Script in Demo Mode

Perform the following sequence to create a full configuration script in Demo Mode:

1. Start the EVKIT software
2. Load the appropriate device initialization script using the **Run Config Script** button
3. Configure the device using the EVKIT software GUI menus
4. Press the **Create Config Script** button in the lower-left corner of the main menu
5. On the **Create Config Script** pop-up menu, specify the file name and location, and <u>check</u> the **Include configuration registers that are still set to their reset values** checkbox
6. On the **Create Config Script** pop-up menu, press the **Create** button

If the specified file already exists, a pop-up message is displayed to confirm that the file should be overwritten. After the configuration file is created, it is displayed in Notepad for review.

4.11.2.3 Creating a Partial Configuration Script in Demo Mode

Perform the following sequence to create a full configuration script in Demo Mode:

1. Start the EVKIT software
2. Load the appropriate device initialization script using the **Run Config Script** button
3. Configure the device using the EVKIT software GUI menus
4. Press the **Create Config Script** button in the lower-left corner of the main menu
5. On the **Create Config Script** pop-up menu, specify the file name and location, and <u>un-check</u> the **Include configuration registers that are still set to their reset values** checkbox
6. On the **Create Config Script** pop-up menu, press the **Create** button

If the specified file already exists, a pop-up message is displayed to confirm that the file should be overwritten. After the configuration file is created, it is displayed in Notepad for review.

4.11.2.4 Creating a Full Configuration Script While Communicating With an EVKIT

Perform the following sequence to create a full configuration script while communicating with an EVKIT:

1. Start the EVKIT software
2. Uncheck the **Demo Mode** check box in the upper left section of the main menu
3. On the **Run Config Script** pop-up menu, press the **Initialize** button to load the device initialization script
4. Configure the device using the EVKIT software GUI menus
5. Press the **Create Config Script** button in the lower-left corner of the main menu
6. On the **Create Config Script** pop-up menu, specify the file name and location, and <u>check</u> the **Include configuration registers that are still set to their reset values** checkbox
7. On the **Create Config Script** pop-up menu, press the **Create** button

If the specified file already exists, a pop-up message is displayed to confirm that the file should be overwritten. After the configuration file is created, it is displayed in Notepad for review.

4.11.2.5 Creating a Partial Configuration Script While Communicating With an EVKIT

Perform the following sequence to create a full configuration script while communicating with an EVKIT:

1. Start the EVKIT software
2. Uncheck the **Demo Mode** check box in the upper left section of the main menu
3. On the **Run Config Script** pop-up menu, press the **Initialize** button to load the device initialization script
4. Configure the device using the EVKIT software GUI menus
5. Press the **Create Config Script** button in the lower-left corner of the main menu
6. On the **Create Config Script** pop-up menu, specify the file name and location, and <u>un-check</u> the **Include configuration registers that are still set to their reset values** checkbox
7. On the **Create Config Script** pop-up menu, press the **Create** button

If the specified file already exists, a pop-up message is displayed to confirm that the file should be overwritten. After the configuration file is created, it is displayed in Notepad for review.

4.11.2.6 Running a Configuration Script

Perform the following sequence to run a configuration script

1. Press the **Run Config Script** button in the lower-left corner of the main window
2. On the **Run Config Script** pop-up menu, specify the file name and location
3. On the **Run Config Script** pop-up menu, press the **Execute** button.

A configuration script can be run while in Demo Mode or communicating with an EVKIT.

4.11.2.7 EVKIT Log File

Whle the EVKIT software is running, a log file is maintained of all device configurations that are performed. This includes any GUI menu updates that correspond to device register writes as well as any register writes performed whn a configuration script is run. The log file can be viewed by pressing the **View Log File** button at the bottom of the main menu. This log file should not be used as a substitute for the device configuration script created using the **Create Config Script** button as described above in this section.

5. EVKIT Errata

None.

6. Revision History

REVISION DATE	DESCRIPTION
12/20/12	First version for EVKIT revB assembly

7. Bill of Materials

Figure 15. EVKIT Bill of Materials

DESIGNATION	QTY	DESCRIPTION	SUPPLIER	PART
Common Components				
B1, B2, B3, B4, B5, B6, B7, B8, B9, B10, FB1, FB2, FB3, FB4	14	GHZ NOISE CHIP FERRITE BEAD, .25 OHM DC, 600 OHM @100MHz, 600 OHM @1GHz, 800mA	MURATA	BLM18HE601SN1D
C19, C20, C21, C22, C23, C26, C27, C29, C30, C35, C36, C38, C39, C41, C42, C43, C44, C45, C47, C58, C60, CB61, CB117, CB169	24	CAP CER 3.3UF 4.0V X5R 0402	AMK	AMK105BJ335MV-F
C14, C28, CB5, CB8, CB11, CB12, CB18, CB19, CB48, CB54, CB55, CB65, CB71, CB73, CB74, CB76, CB77, CB78, CB79, CB81, CB82, CB84, CB93, CB99, CB115, CB129, CB139, CB140, CB142, CB143, CB144, CB147	32	0603 CERAM 1.0uF 6.3V 10% MULTILAYER	PAN	ECJ-1VB0J105K
C15, C54, CB23, CB28, CB40, CB66, CB67, CB68, CB69, CB70, CB83, CB146, CB151	13	L_0603 CERAM .1uF 16V 20% X7R	AVX	0603YC104MAT
C7, C8, C9, C10, C13, C17, CB7, CB9, CB13, CB17, CB21, CB24, CB30, CB32, CB34, CB35, CB36, CB38, CB56, CB57, CB63, CB72, CB125, CB137	24	0603 CERAM 10uF 6.3V 20% MULTILAYER	PAN	ECJ-1VB0J106M
C11, C12, C16, C18, C24, C31, C32, C33, C37, C46, C48, C49, C50, C52, C53, C55, C56, C57, C59, C61, C62, CB37, CB39, CB41, CB42, CB43, CB44, CB45, CB47, CB49, CB50, CB51, CB52, CB53, CB58, CB64, CB94, CB95, CB98, CB102, CB103, CB104, CB106, CB107, CB108, CB110, CB111, CB112, CB113, CB116, CB119, CB120, CB123, CB124, CB127, CB128, CB130, CB131, CB136, CB145, CB149, CB154, CB155, CB158, CB162, CB163, CB164, CB165	68	0402 CERAM 0.1uF 16V 10%	PAN	ECJ-0EB1C104K
C51, CB148, CB153	3	L_0603 CERAM .001uF 50V 10%	PAN	ECJ-1VB1H102K
CB20	1	CAPACITOR, TANT 68uF 16V 20%	NICHICON	F931C686MNC
C25, C34, C40, C63, C65, CB6, CB10, CB14, CB15, CB16, CB22, CB26, CB29, CB33, CB46, CB59, CB60, CB62, CB75, CB80, CB86, CB87, CB88, CB89, CB90, CB91, CB92, CB97, CB105, CB118, CB122, CB126, CB132, CB133, CB134, CB135, CB138, CB141, CB150, CB152, CB160	41	0603 CERAM 4.7uF 6.3V 10% MULTILAYER	PAN	ECJ-1VB0J475K
CB156, CB157, CB159, CB166, CB167, CB168	6	L_0603 CERAM .01uF 50V 10% X7R	AVX	06035C103KAT
CB161	1	D CASE TANT 68uF 16V 20%	PAN	ECS-T1CD686R

DESIGNATION	QTY	DESCRIPTION	SUPPLIER	PART
CB25, CB27	2	0603 CERAM 22pF 50V 5%	PAN	ECJ-1VC1H220J
CB31	1	0805 CERAM .47uF 16V 10%	PAN	ECJ-2YB1C474K
DB3, DB6	2	DIODE 1A 50V SMD	DIODES INC	S1AB-13-F
DB1, DB2, DB4, DB5	4	SCHOTTKY DIODE, 1 AMP 40 VOLT (OK TO SUBSTITUTE Vishay VS-10BQ040PBF)	IRF	10BQ040PBF
DS1, DS4, DS5	3	L_LED, GREEN, SMD	PAN	LN1351C
DS2, DS3, DS6, DS7, DS8, DS9, DS10	7	LED, RED, SMD	PAN	LN1251C
TP12, GND_TP2, GND_TP3, GND_TP4, GND_TP5, GND_TP6, GND_TP7	7	STANDARD GROUND CLIP	KEYSTONE	4954
HB1, HB2, HB3, HB4, HB5, HB6, HB7, HB8, HB9, HB10, HB11	11	Rubber bumper 0.5 inch	NA	SJ5518-0
J1, J14, J19	3	L_TERMINAL STRIP, 10 PIN, DUAL ROW, VERT	STC	TSW-105-07-T-D
J2	1	L_TERMINAL STRIP, 6 PIN, DUAL ROW, VERT	STC	TSW-103-07-T-D
J3	1	2.0MM SURFACE MOUNT POWER JACK	CUI INC	PJ-002AH-SMT
J31, J36, J45, J53, J54	5	TERMINAL STRIP, 6 PIN, DUAL ROW, VERT	STC	TSW-103-07-T-D
J4	1	CONN, USB, TYPE B SINGLE RT ANGLE	MOL	67068-8000
J5, J6, J7, J8, J9, J26, J44	7	TERMINAL STRIP, 10 PIN, DUAL ROW, VERT	NA	NA
JMP1, JMP2, JMP3, JMP4, JMP5, JMP6, JMP8, JMP10, JMP23, JMP24, JMP25, JMP26, JMP28, JMP30	14	L_HEADER, 3-PIN, .100 CENTERS, VERTICAL	STC	TSW-103-07-T-S
JMP7, JMP9, JMP11, JMP12, JMP13, JMP14, JMP17, JMP18, JMP19, JMP27, JMP29, JMP31, JMP32	13	L_2 PIN HEADER, .100 CENTERS, VERTICAL	STC	TSW-102-07-T-S
R51, R52, R63, R64, R65, R66, R67, R68, R69, R70, R71, R72, R73, R74, R75, R76, R77, R78	18	RES 0402 30.0 OHM 1/16W 1%	PAN	ERJ-2RKF30R0X
R79, R80, R81, R82	4	RES 0402 30.0 OHM 1/16W 1%	PAN	ERJ-2RKF30R0X
R15, R16, R17, R19	4	RES 0603 0.0 Ohm 1/16W 5%	PAN	ERJ-3GEY0R00V
RB13, RB15, RB16, RB19, RB30, RB31, RB32, RB38	8	RES 0402 1.00 KOHM 1/16W 1%	PAN	ERJ-2RKF1001X
R28, R29, R34, R35, R41, R42, R56, R57	8	RES 0402 49.9 OHM 1/16W 1%	PAN	ERJ-2RKF49R9X
R3, RB20, RB22, RB25, RB26, RB33	6	RES 0603 332 Ohm 1/16W 1%	PAN	ERJ-3EKF3320V
R4, R6, R26, R27, R53, R54, RB1, RB2, RB28, RB29, RB36, RB40	12	RES 0603 10.0K Ohm 1/16W 1%	PAN	ERJ-3EKF1002V
R45, RB34, RB37	3	RES 0402 100 OHM 1/16W 1%	PAN	ERJ-2RKF1000X
R5, RB3, RB4, RB8, RB9, RB11	6	Current Sensing Resistor 0.02 ohm	Ohmite	LVK12R020DERCT-ND
C52, R7, R8, R9, R10, R11, R12, R13, R14, R18, R20, R21, R22, R30, R31, R32, R33, R36, R37, R38, R39, R46, R47, R48, R49, R50, R55, R58, R148, RB39, RB42	31	RES 0402 0 OHM 1/10W 5%	PAN	ERJ-2GE0R00X
RB10	1	RES 0603 100K Ohm 1/16W 1%	PAN	ERJ-3EKF1003V
RB12, RB14, RB17, RB18, RB21, RB23, RB24, RB27	8	RES 0603 330 Ohm 1/16W 5%	PAN	ERJ-3GEYJ331V
RB5, RB6	2	RES 0603 33.2 Ohm 1/16W 1%	PAN	ERJ-3EKF33R2V
RB7	1	RES 0603 1.00M Ohm 1/16W 1%	PAN	ERJ-3EKF1004V
SW1	1	SWITCH MOM 4PIN SINGLE POLE	PAN	EVQPAE04M
TP2, TP3, TP4, TP5, TP7, TP8, TP9, TP10, TP11	9	TESTPOINT, 1 PLATED HOLE RED	KEYSTONE	5000R
U1	1	IC, HCS08 8-BIT MICROCONTROLLER, 32K FLASH, 2K RAM, 2 UART, 2 SPI, I2C, USB, -40 TO 85C, 64 PIN LQFP	FREESCALE	MC9S08JM32CLH-ND
UB20	1	Single/Dual LVDS Line Receiver	Maxim	MAX9111EKA+
UB5, UB6, UB13, UB21	4	LINEAR REGULATOR, 3.3V, 16 PIN TSSOP-EP	MAX	MAX1793EUE33/V+-ND
U2, UB1, UB2, UB7, UB8, UB14	6	Precision Current-Sense Amplifier	MAXIM	MAX9610FEXK+T
UB10	1	LINEAR REGULATOR, 1.5V, 16 PIN TSSOP-EP	MAX	MAX1793EUE-15

DESIGNATION	QTY	DESCRIPTION	SUPPLIER	PART
UB11	1	MICROPROCESSOR VOLTAGE MONITOR, 3.08V RESET, 4PIN SOT143, LEAD-FREE	MAX	MAX811TEUS+T
UB12	1	ULTRA-HIGH-PRECISION, ULTRA-LOW-NOISE SERIES VOLTAGE REFERENCE, 4.096V, 8 PIN UMAX	MAX	MAX6126BASA41+
UB15, UB16, UB17, UB18, UB19	5	HIGH SPEED BUFFER	FAIRCHILD	NC7SZ86
UB23	1	Low-Voltage DDR Linear Regulators Sink, Source up to 3A	MAXIM	MAX1510ETB+
UB3, UB4	2	LINEAR REGULATOR, 1.8V, 16 PIN TSSOP-EP, ROHS/LEAD-FREE	MAX	MAX1793EUE18+
UB9	1	LINEAR REGULATOR, 2.5V, 16 PIN TSSOP-EP	MAX	MAX1793EUE-25+
X1	1	XTAL, HC49SD, 12.0000MHz +/-50PPM, CL=20PF	FOX	FOXSDLF-120-20
Y9	1	VECTRON OSC OUTLINE WITH TERMINAL SOCKET, 10-PIN, 2 ROW VERTICAL.	STC	SSW-105-01-T-D
J10, J11, J12, J13, J15, J16, J17, J18, J20, J21, J22, J23, J24, J25, J27, J28, J29, J30, J32, J33, J34, J35, J37, J38, J39, J40, J41, J42, J43, J46, J47, J48, J49, J50, J51, J52	36	CONNECTOR, SMB, 50 OHM VERTICAL, 5PIN	AMP	413990-1
		MAX24210 EVKIT Specific Components		
U5	1	10-Output Any-Rate Timing IC	MICROSEMI	MAX24210EXG+
Y7	1	OSCILLATOR, RAKON TCXO, 3.3V, 20.48 MHZ, 3mmX5mm SMD	RAKON	TX6287-20.480M
Y8	1	OSCILLATOR, VECTRON XO, 3.3V, 98.304MHZ, 4 PIN 5x7mm SMD	VECTRON	VCC1-1541-98M304000
Y4	1	8 PIN DIP SOCKET	ATM	8 DIP SOCKET
U3	1	SPI SERIAL EEPROM 2M 8 PIN SOIC 2.7V TO 3.6V	ATMEL	AT25160B-SSHL-B
NA	1	49.152MHz Crystal Daugher Card	MICROSEMI	Figure 17
		MAX24310 EVKIT Specific Components		
U5	1	10-Output Any-Rate Timing IC with Internal EEPROM	MICROSEMI	MAX24310EXG+
Y7	1	OSCILLATOR, RAKON TCXO, 3.3V, 20.48 MHZ, 3mmX5mm SMD	RAKON	TX6287-20.480M
Y8	1	OSCILLATOR, VECTRON XO, 3.3V, 98.304MHZ, 4 PIN 5x7mm SMD	VECTRON	VCC1-1541-98M304000
NA	1	49.152MHz Crystal Daugher Card	MICROSEMI	Figure 17
		MAX24410 EVKIT Specific Components		
U5	1	10-Output Any-Rate Clock Multiplier	MICROSEMI	MAX24410EXG+
Y8	1	OSCILLATOR, VECTRON XO, 3.3V, 78.125MHZ, 4 PIN 5x7mm SMD	VECTRON	VCC1-1539-78M1250000
Y4	1	8 PIN DIP SOCKET	ATM	8 DIP SOCKET
U3	1	SPI SERIAL EEPROM 2M 8 PIN SOIC 2.7V TO 3.6V	ATMEL	AT25160B-SSHL-B
NA	1	50MHz Crystal Daugher Card	MICROSEMI	Figure 16
		MAX24510 EVKIT Specific Components		
U5	1	10-Output Any-Rate Clock Multiplier with Internal EEPROM	MICROSEMI	MAX24510EXG+
Y8	1	OSCILLATOR, VECTRON XO, 3.3V, 78.125MHZ, 4 PIN 5x7mm SMD	VECTRON	VCC1-1539-78M1250000
NA	1	49.152MHz Crystal Daugher Card	MICROSEMI	Figure 16

MAX24610 EVKIT Specific Components				
U5	1	10-Output Any-Rate Line Card Timing IC	MICROSEMI	MAX24610EXG+
Y7	1	OSC ILLATOR, RAKON TCXO, 3.3V, 20.48 MHZ, 3mmX5mm SMD	RAKON	TX6287-20.480M
Y8	1	OSCILLATOR, VECTRON XO, 3.3V, 98.304MHZ, 4 PIN 5x7mm SMD	VECTRON	VCC1-1541-98M304000
Y4	1	8 PIN DIP SOCKET	ATM	8 DIP SOCKET
U3	1	SPI SERIAL EEPROM 2M 8 PIN SOIC 2.7V TO 3.6V	ATMEL	AT25160B-SSHL-B
NA	1	49.152MHz Crystal Daugher Card	MICROSEMI	Figure 17
MAX24710 EVKIT Specific Components				
U5	1	10-Output Any-Rate Line Card Timing IC with Internal EEPROM	MICROSEMI	MAX24710EXG+
Y7	1	OSC ILLATOR, RAKON TCXO, 3.3V, 20.48 MHZ, 3mmX5mm SMD	RAKON	TX6287-20.480M
Y8	1	OSCILLATOR, VECTRON XO, 3.3V, 98.304MHZ, 4 PIN 5x7mm SMD	VECTRON	VCC1-1541-98M304000
NA	1	49.152MHz Crystal Daugher Card	MICROSEMI	Figure 17

Figure 16. EVKIT 50MHz Crystal Daughter Card Bill of Materials

50MHz Crystal Daugher Card				
XDC_X1	1	Crystal, 50MHz +/-20ppm, CL=10pf	VECTRON	VXM7-1148-50M000000
XDC_C1, XDC_C2	2	Capacitor, ceramic, 16PF, 100V, 1%, 0603	AVX	06031U160FAT2A
XDC_R1	1	RES 0603 1.00M Ohm 1/16W 1%	PAN	ERJ-3EKF1004V
XDC_R2	1	RES 0603 1.21M Ohm 1/16W 1%	PAN	ERJ-3EKF1211V

Figure 17. EVKIT 49.152MHz Crystal Daughter Card Bill of Materials

49.152MHz Crystal Daugher Card				
XDC_X1	1	Crystal, 49.152MHz +/-20ppm, CL=10pf	VECTRON	VXM7-1149-49M152000
XDC_C1, XDC_C2	2	Capacitor, ceramic, 16PF, 100V, 1%, 0603	AVX	06031U160FAT2A
XDC_R1	1	RES 0603 1.00M Ohm 1/16W 1%	PAN	ERJ-3EKF1004V
XDC_R2	1	RES 0603 1.21M Ohm 1/16W 1%	PAN	ERJ-3EKF1211V

8. Schematics

See the following pages.

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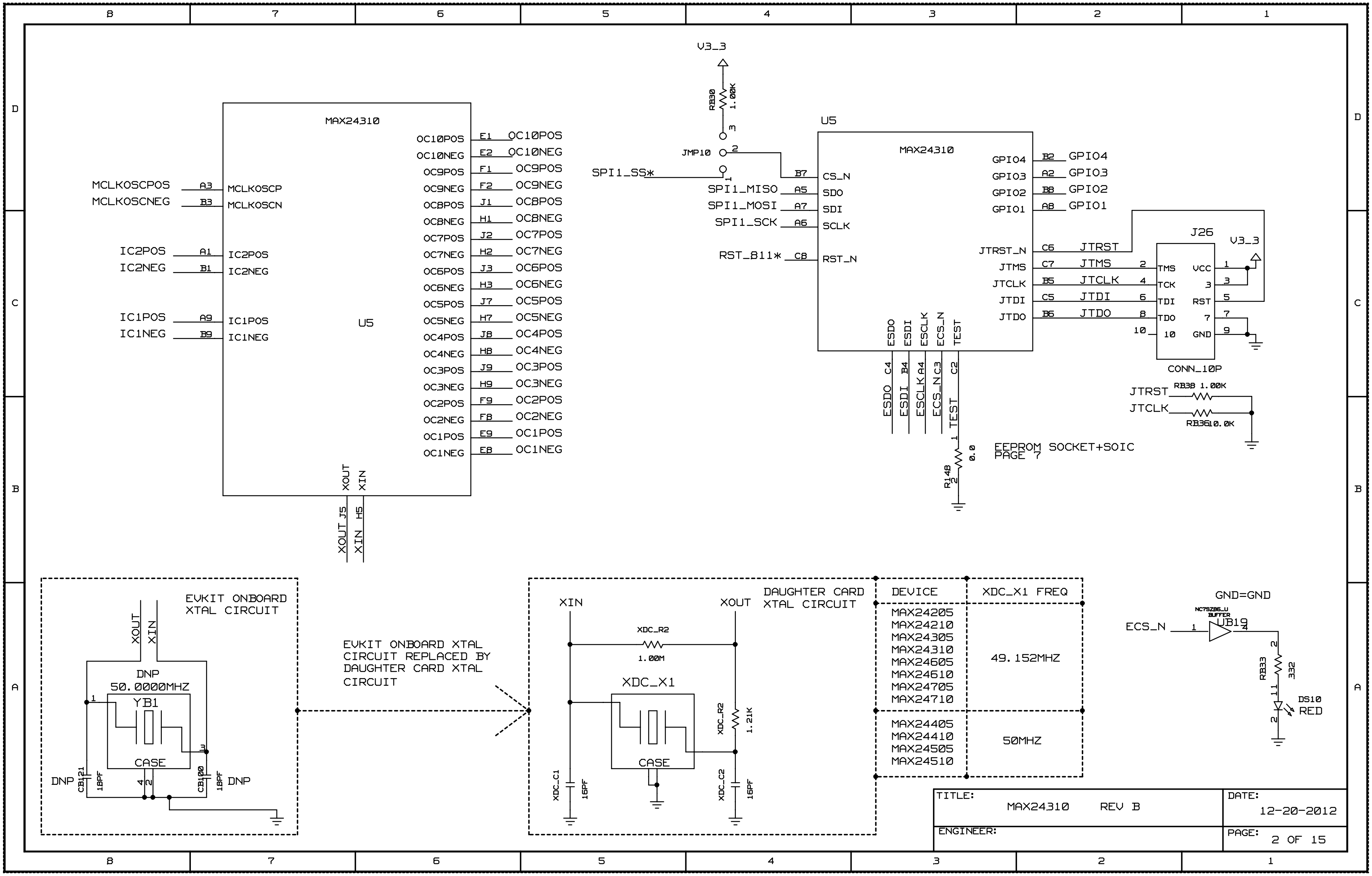

MAX24310
U5
MCLKOSCPOS
MCLKOSCNEG
IC2POS
IC2NEG
IC1POS
IC1NEG
MCLKOSCP
MCLKOSCN
OC10POS
OC10NEG
OC9POS
OC9NEG
OC8POS
OC8NEG
OC7POS
OC7NEG
OC6POS
OC6NEG
OC5POS
OC5NEG
OC4POS
OC4NEG
OC3POS
OC3NEG
OC2POS
OC2NEG
OC1POS
OC1NEG
XOUT
XIN
V3_3
RB30
1.00K
JMP10
SPI1_SS*
SPI1_MISO
SPI1_MOSI
SPI1_SCK
RST_811*
CS_N
SDO
SDI
SCLK
RST_N
GPIO4
GPIO3
GPIO2
GPIO1
JTRST_N
JTMS
JTCLK
JTDI
JTDO
ESDO
ESDI
ESCLK
ECS_N
TEST
J26
CONN_10P
TMS
TCK
TDI
TDO
VCC
RST
GND
JTRST
JTCLK
RB38 1.00K
RB36 10.0K
R148
0.0
EEPROM SOCKET+SOIC
PAGE 7
EVKIT ONBOARD
XTAL CIRCUIT
DNP
50.0000MHZ
YB1
CASE
CB121
CB100
18PF
EVKIT ONBOARD XTAL
CIRCUIT REPLACED BY
DAUGHTER CARD XTAL
CIRCUIT
DAUGHTER CARD
XTAL CIRCUIT
XDC_R2
1.00M
XDC_X1
1.21K
XDC_C1
XDC_C2
16PF
DEVICE
XDC_X1 FREQ
MAX24205
MAX24210
MAX24305
MAX24310
MAX24605
MAX24610
MAX24705
MAX24710
49.152MHZ
MAX24405
MAX24410
MAX24505
MAX24510
50MHZ
GND=GND
ECS_N
NC7SZ86_U
BUFFER
UB19
RB33
332
DS10
RED
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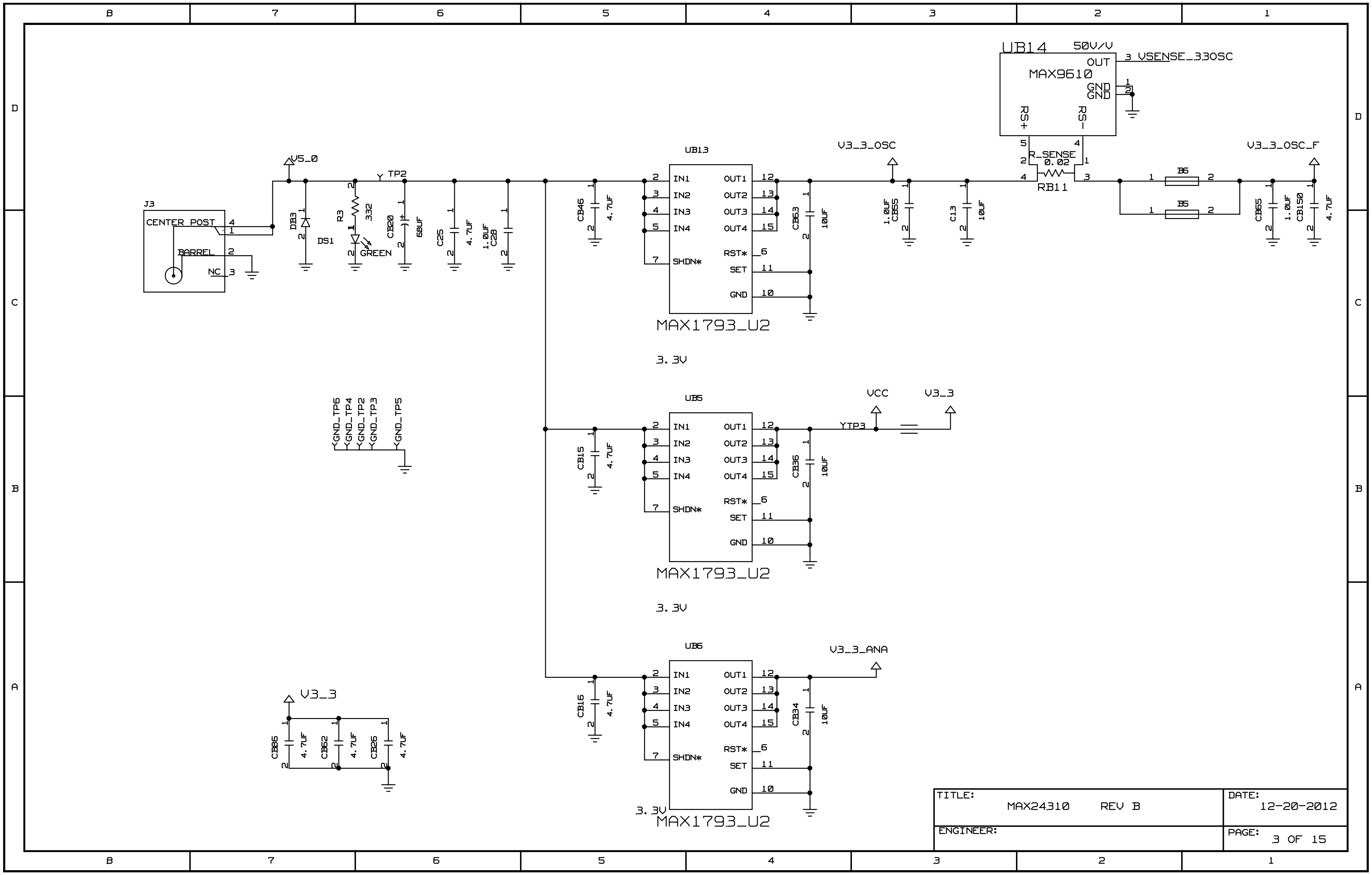

J3
CENTER POST
BARREL
NC
V5_0
DB3
DS1
R3
332
GREEN
TP2
CB20
68UF
C25
4.7UF
1.0UF
C28
UB13
IN1
IN2
IN3
IN4
SHDN*
OUT1
OUT2
OUT3
OUT4
RST*
SET
GND
MAX1793_U2
CB46
4.7UF
CB63
10UF
3.3V
V3_3_OSC
1.0UF
CB55
C13
10UF
UB14
50V/V
MAX9610
OUT
GND
GND
RS+
RS-
3 VSENSE_33OSC
R_SENSE
0.02
RB11
B6
B5
V3_3_OSC_F
CB65
1.0UF
CB150
4.7UF
GND_TP6
GND_TP4
GND_TP2
GND_TP3
GND_TP5
UB5
CB15
4.7UF
CB36
10UF
VCC
V3_3
TP3
MAX1793_U2
3.3V
UB6
V3_3_ANA
CB16
4.7UF
CB34
10UF
3.3V
MAX1793_U2
V3_3
CB86
4.7UF
CB62
4.7UF
CB26
4.7UF
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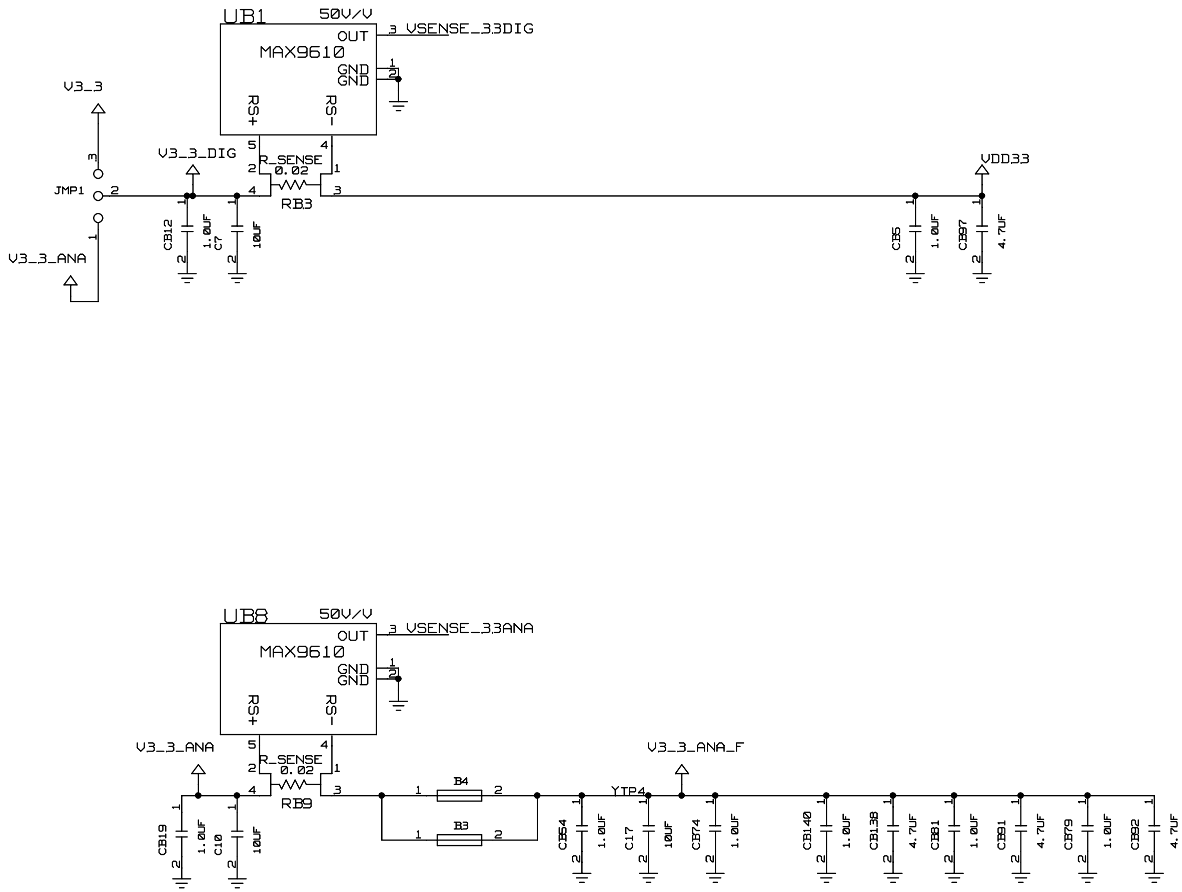

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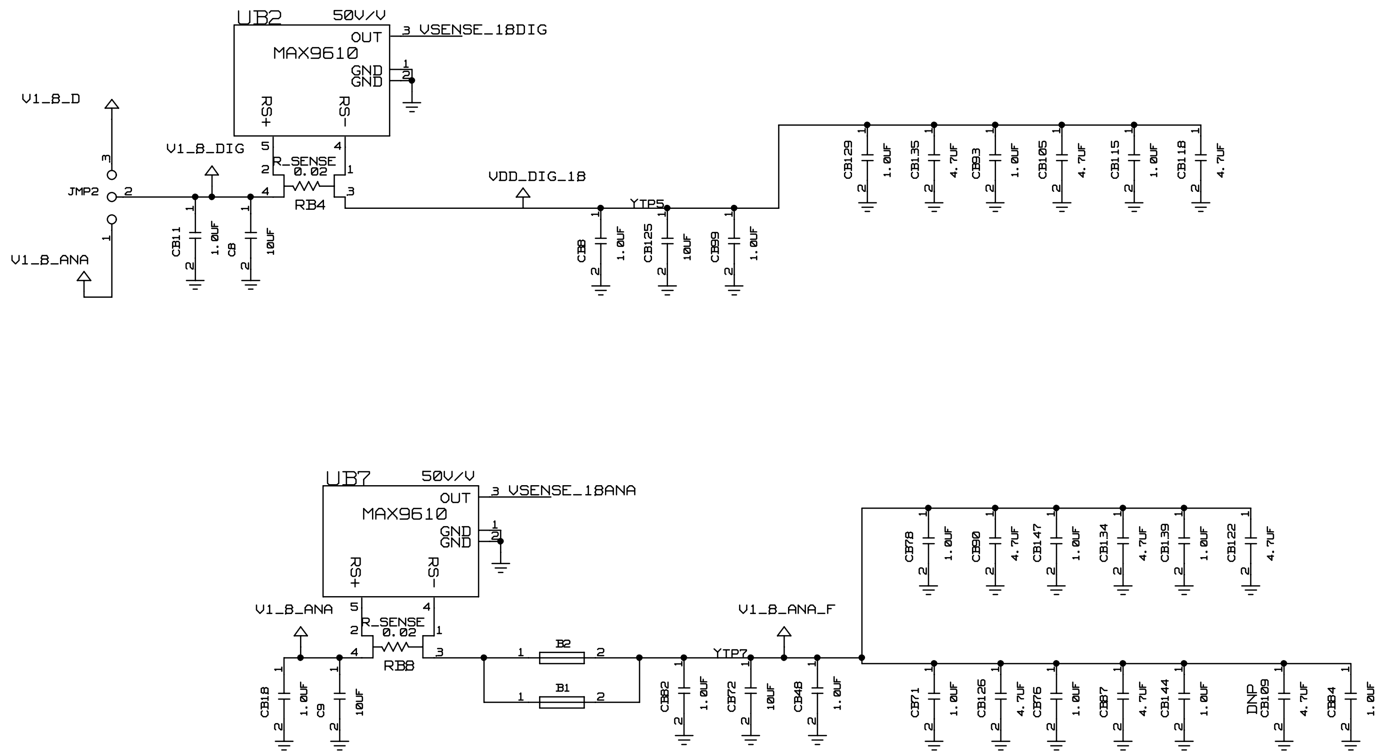
NOTES:
1. CB109 IS NOT POPULATED TO PROVIDE A CLEAR MOUNTING AREA FOR THE CRYSTAL DAUGHTER CARD



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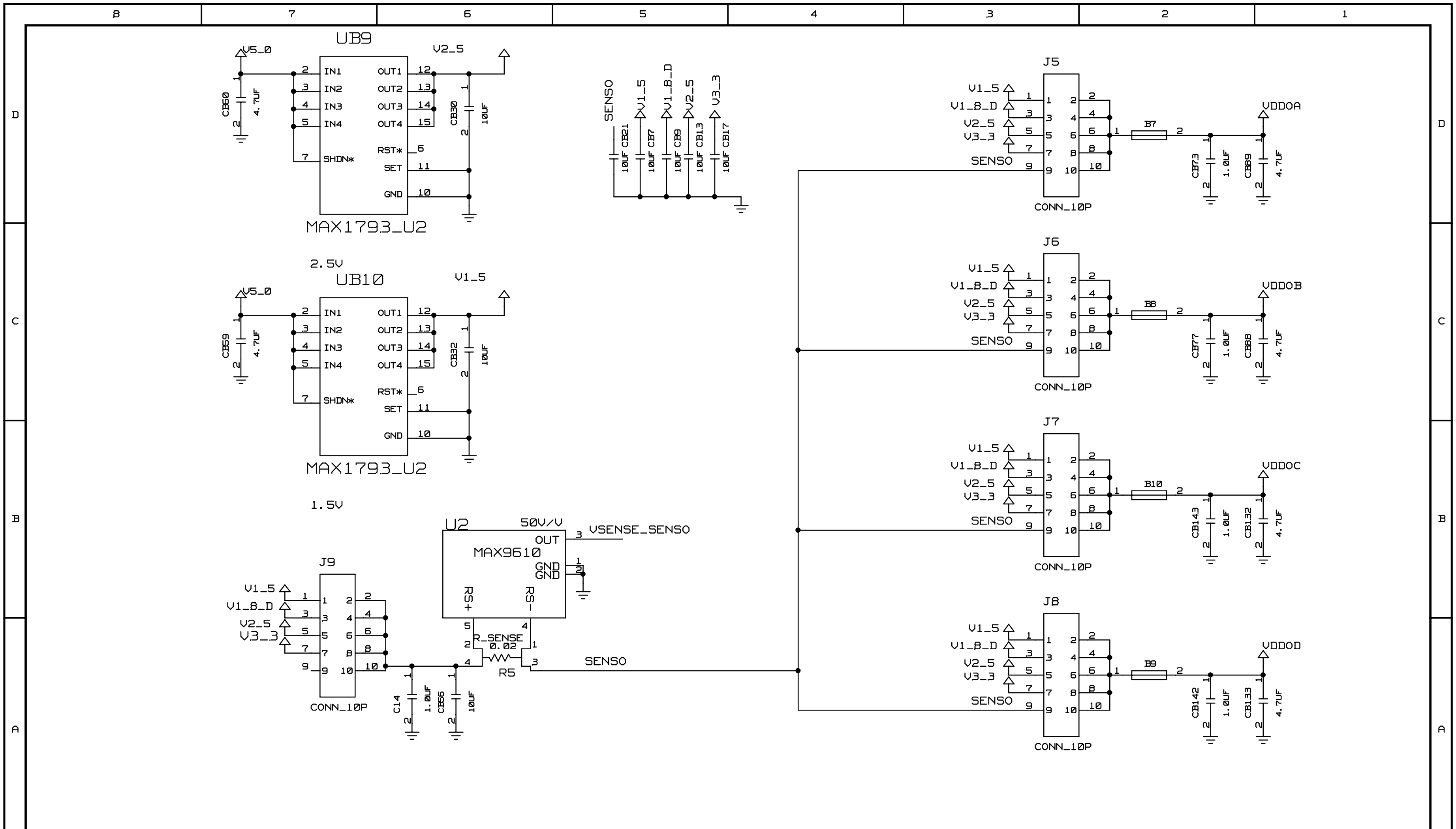

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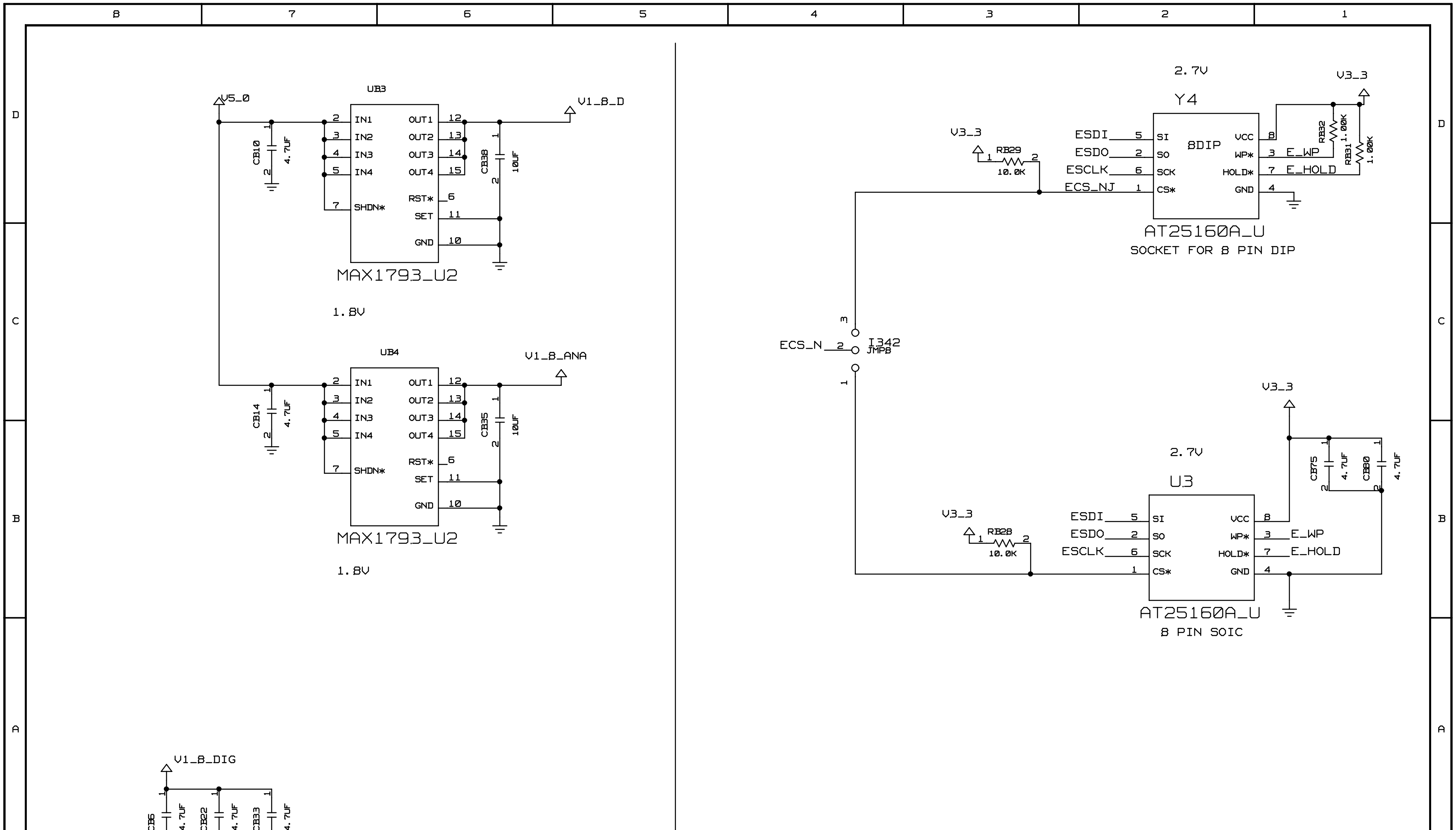

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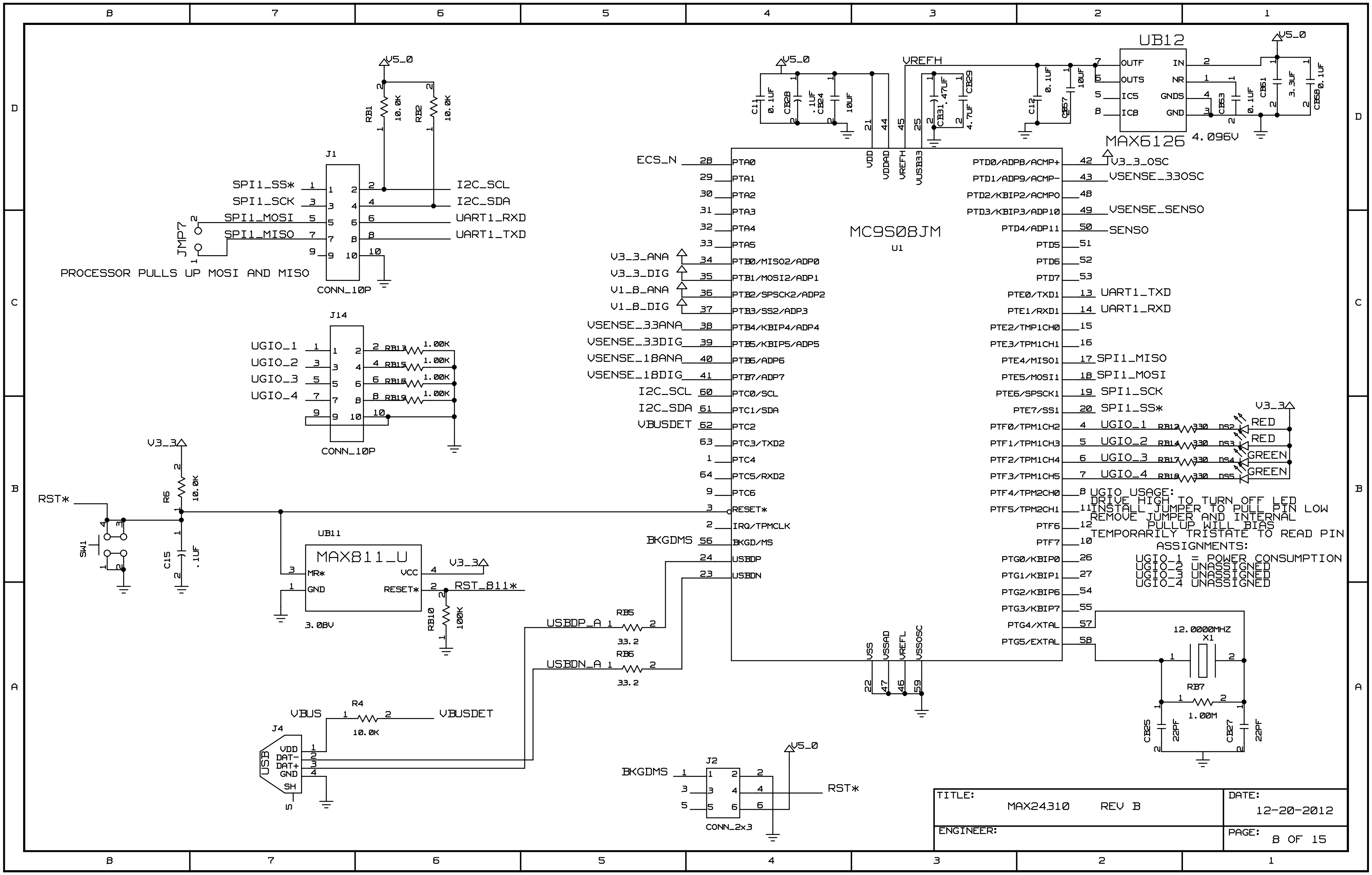

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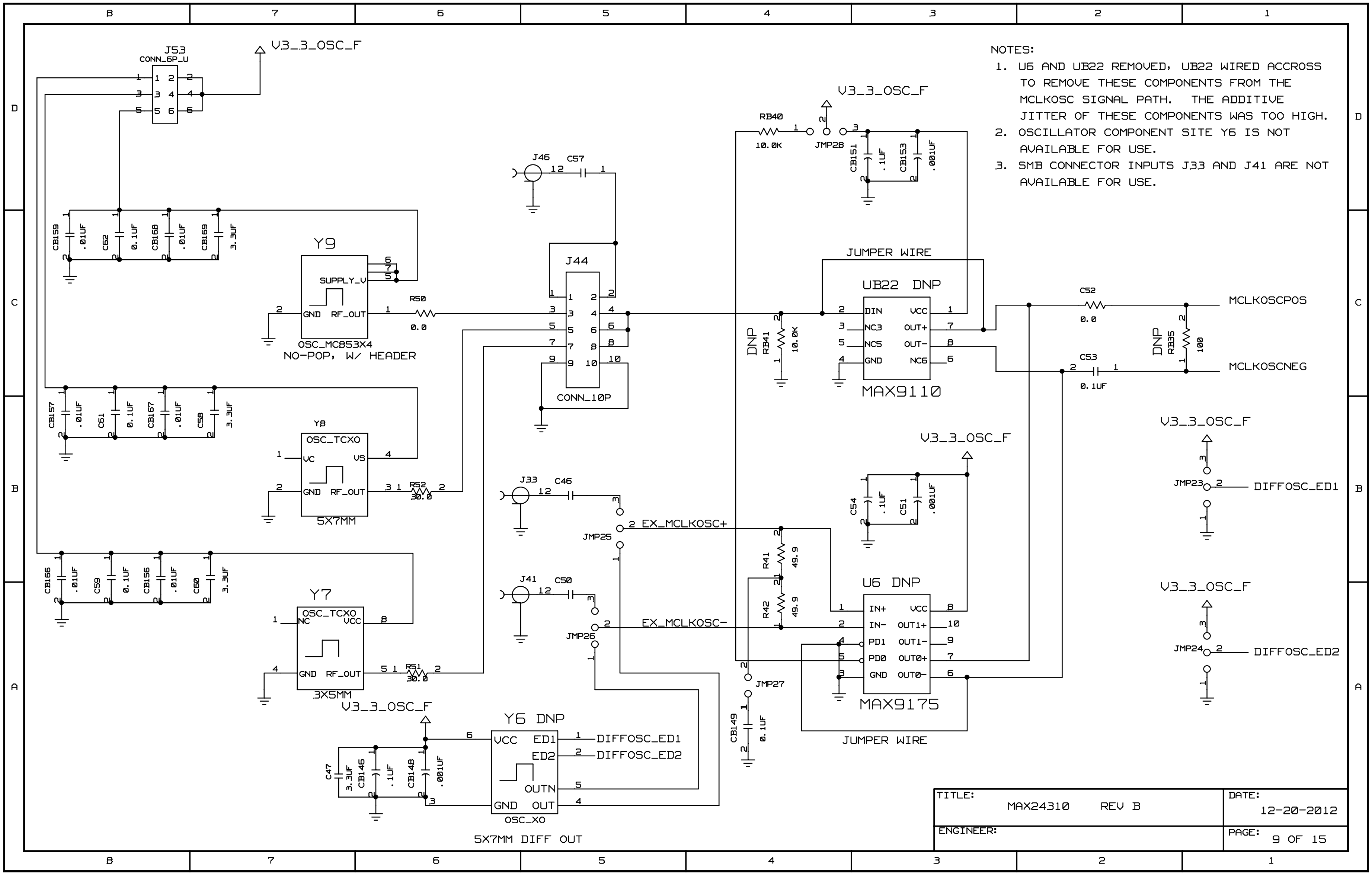

NOTES:

1. U6 AND UB22 REMOVED, UB22 WIRED ACCROSS TO REMOVE THESE COMPONENTS FROM THE MCLKOSC SIGNAL PATH. THE ADDITIVE JITTER OF THESE COMPONENTS WAS TOO HIGH.
2. OSCILLATOR COMPONENT SITE Y6 IS NOT AVAILABLE FOR USE.
3. SMB CONNECTOR INPUTS J33 AND J41 ARE NOT AVAILABLE FOR USE.

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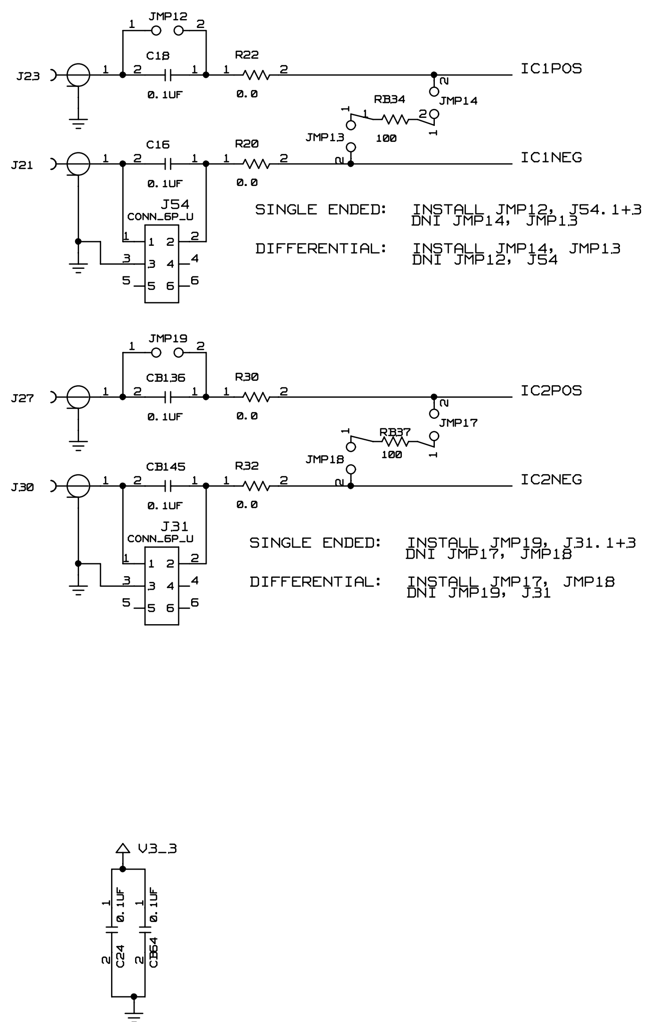

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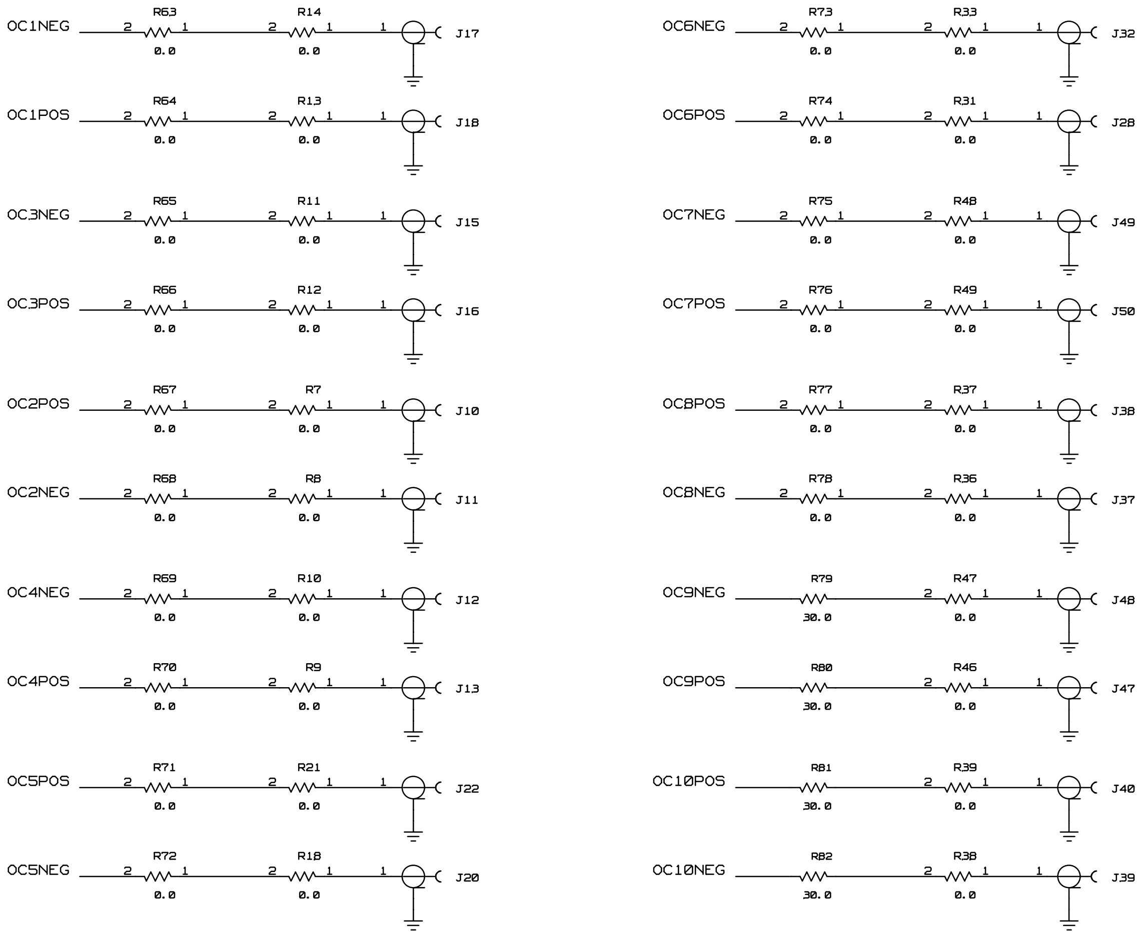

NOTES:

1. THE TERMINATION NETWORKS FOR OC1P/N THROUGH OC8P/N ARE CONFIGURED AS DC-COUPLED DIFFERENTIAL CML.
2. THE TERMATION NETWORKS FOR OC9P/N AND OC10P/N ARE CONFIGURED AS DUAL SINGLE-ENDED CMOS

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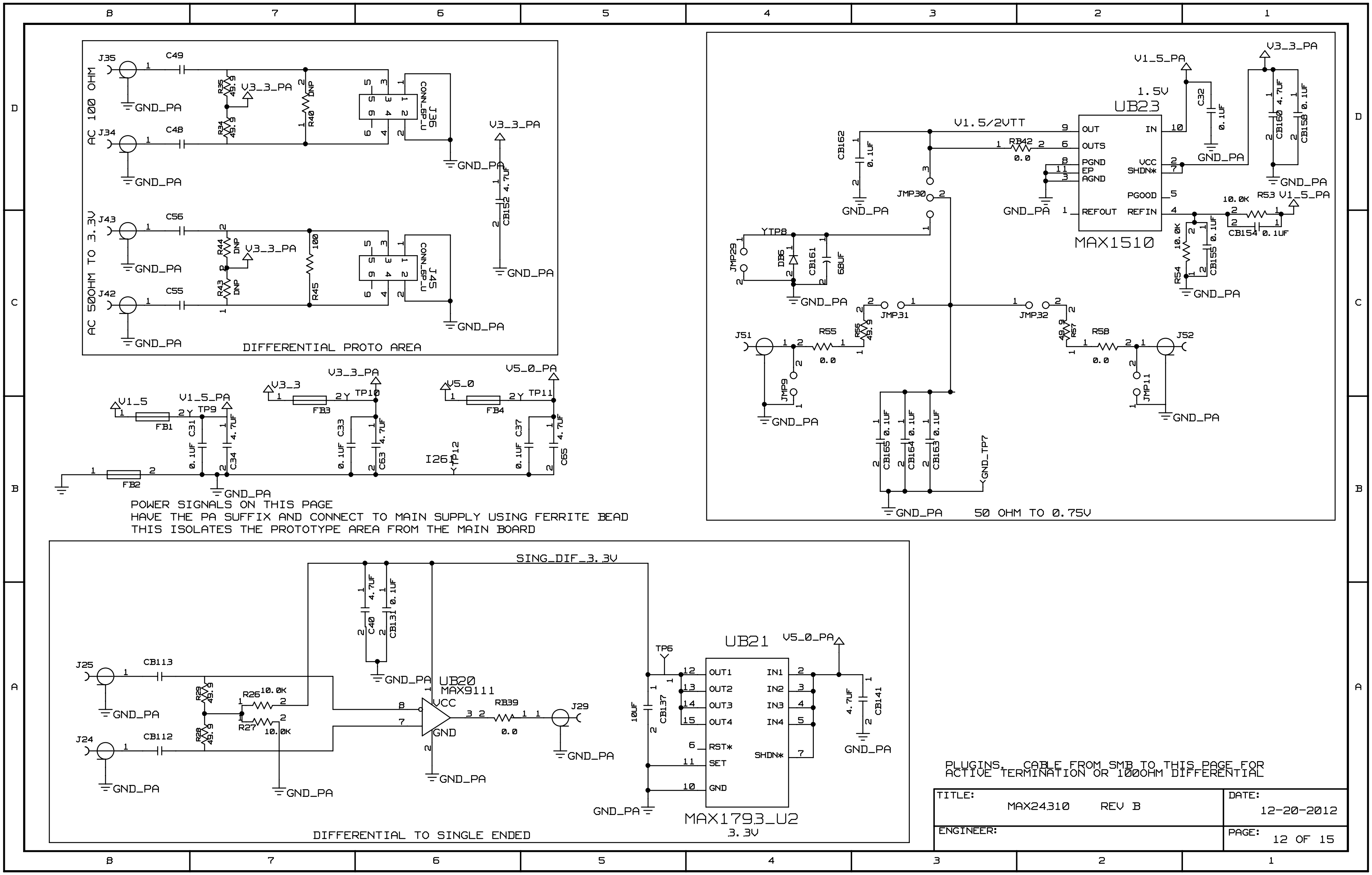
DIFFERENTIAL PROTO AREA
AC 100 OHM
AC 50OHM TO 3.3V
J35
J34
J43
J42
C49
C48
C56
C55
R35 49.9
R34 49.9
R44 DNP
R43 DNP
R40 DNP
R45 100
J36 CONN_SP_U
J45 CONN_SP_U
V3_3_PA
GND_PA
CB152 4.7UF
V1_5
V1_5_PA
V3_3
V5_0
V5_0_PA
FB1
FB2
FB3
FB4
TP9
TP10
TP11
TP12
I261
C31 0.1UF
C34 4.7UF
C33 0.1UF
C63 4.7UF
C37 0.1UF
C65 4.7UF
POWER SIGNALS ON THIS PAGE
HAVE THE PA SUFFIX AND CONNECT TO MAIN SUPPLY USING FERRITE BEAD
THIS ISOLATES THE PROTOTYPE AREA FROM THE MAIN BOARD
UB23
1.5V
MAX1510
V1.5/2VTT
OUT
OUTS
PGND
EP
AGND
REFOUT
IN
VCC
SHDN*
PGOOD
REFIN
RB42 0.0
CB162 0.1UF
C32 0.1UF
CB160 4.7UF
CB158 0.1UF
R53 10.0K
R54 10.0K
CB154 0.1UF
CB155 0.1UF
JMP29
JMP30
JMP31
JMP32
JMP9
JMP11
YTP8
DB6
CB161 68UF
J51
J52
R55 0.0
R56 49.9
R57 49.9
R58 0.0
CB165 0.1UF
CB164 0.1UF
CB163 0.1UF
GND_TP7
50 OHM TO 0.75V
DIFFERENTIAL TO SINGLE ENDED
SING_DIF_3.3V
J25
J24
CB113
CB112
R29 49.9
R28 49.9
R26 10.0K
R27 10.0K
C40 4.7UF
CB131 0.1UF
UB20
MAX9111
VCC
GND
RB39 0.0
J29
TP6
UB21
MAX1793_U2
3.3V
OUT1
OUT2
OUT3
OUT4
RST*
SET
GND
IN1
IN2
IN3
IN4
SHDN*
CB137 10UF
CB141 4.7UF
PLUGINS. CABLE FROM SMB TO THIS PAGE FOR
ACTIVE TERMINATION OR 100OHM DIFFERENTIAL
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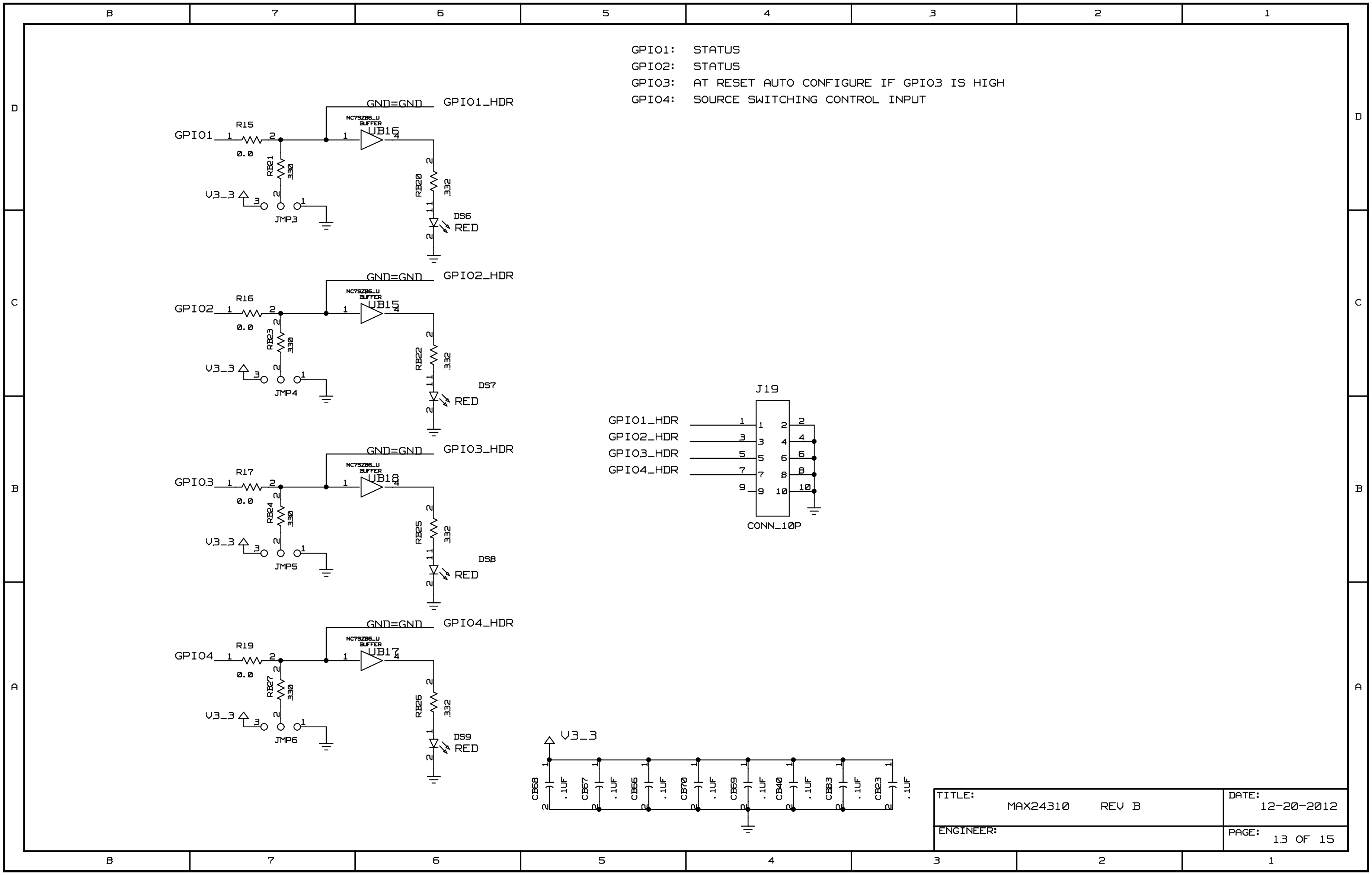
GPIO1: STATUS
GPIO2: STATUS
GPIO3: AT RESET AUTO CONFIGURE IF GPIO3 IS HIGH
GPIO4: SOURCE SWITCHING CONTROL INPUT



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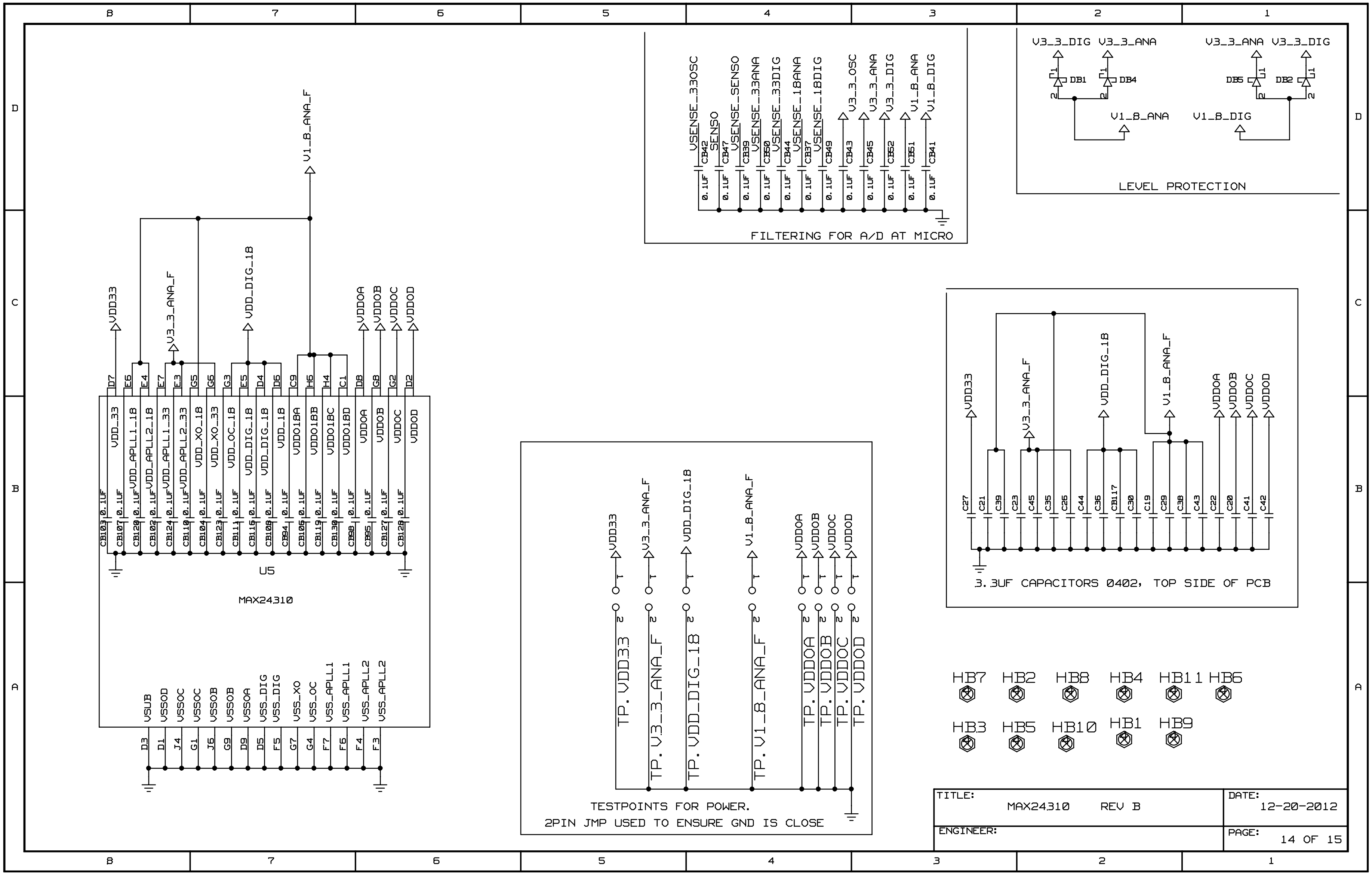

V1_8_ANA_F
VDD33
V3_3_ANA_F
VDD_DIG_18
VDDOA
VDDOB
VDDOC
VDDOD
U5
MAX24310
FILTERING FOR A/D AT MICRO
LEVEL PROTECTION
V3_3_DIG V3_3_ANA
V1_8_ANA V1_8_DIG
3.3UF CAPACITORS 0402, TOP SIDE OF PCB
TESTPOINTS FOR POWER.
2PIN JMP USED TO ENSURE GND IS CLOSE
TP.VDD33
TP.V3_3_ANA_F
TP.VDD_DIG_18
TP.V1_8_ANA_F
TP.VDDOA
TP.VDDOB
TP.VDDOC
TP.VDDOD
HB7 HB2 HB8 HB4 HB11 HB6
HB3 HB5 HB10 HB1 HB9
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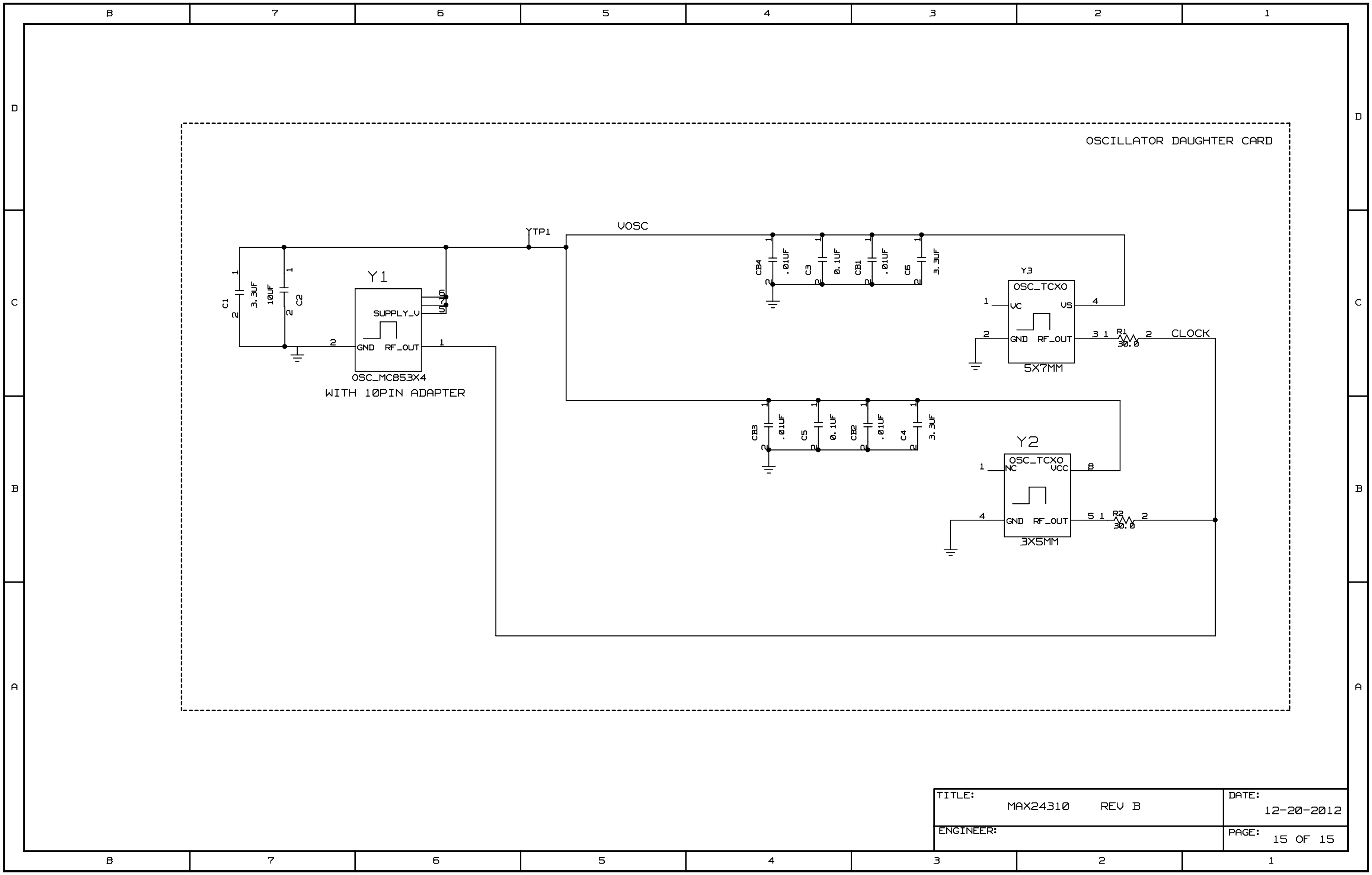
OSCILLATOR DAUGHTER CARD
TP1
VOSC
C1
3.3UF
10UF
C2
Y1
SUPPLY_V
GND
RF_OUT
OSC_MCB53X4
WITH 10PIN ADAPTER
CB4
.01UF
C3
0.1UF
CB1
.01UF
C6
3.3UF
Y3
OSC_TCXO
VC
VS
GND
RF_OUT
R1
30.0
CLOCK
5X7MM
CB3
.01UF
C5
0.1UF
CB2
.01UF
C4
3.3UF
Y2
OSC_TCXO
NC
VCC
GND
RF_OUT
R2
30.0
3X5MM
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