MAX34460 Evaluation Kit
Evaluates: MAX34460

General Description

The MAX34460 evaluation kit (EV kit) provides the hardware and software graphical user interface (GUI) necessary to evaluate the MAX34460 PMBus™ 12-channel voltage monitor and sequencer. The EV kit includes a MAX34460ETM+ installed, as well as four power supplies that can be sequenced, monitored, and margined by the IC.

EV Kit Contents

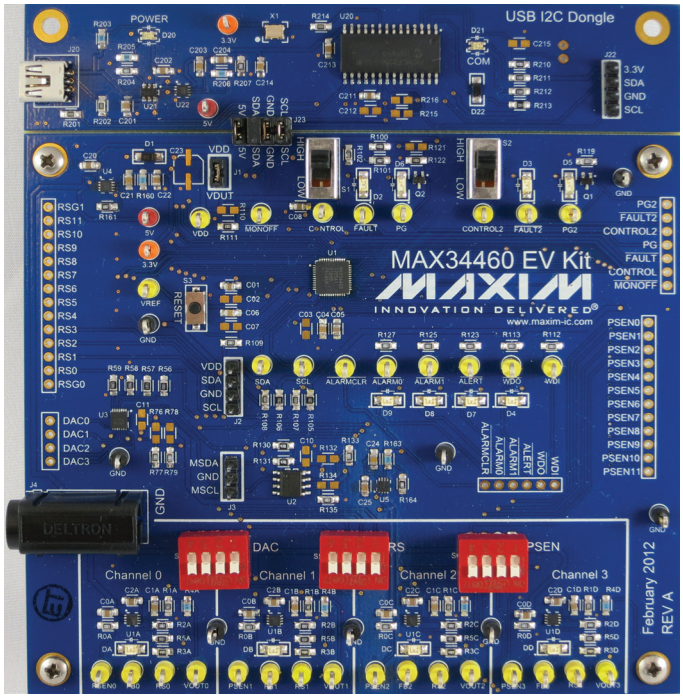
- **Assembled Circuit Board Including MAX34460ETM+**
- **Mini USB Cable**

Features

- **Easy Evaluation of the MAX34460**
- **Four Power-Supply Channels**
- **EV Kit Hardware is USB Powered (USB Cable Included)**
- **USB HID Interface**
- **Windows XP®- and Windows® 7-Compatible Software**
- **RoHS Compliant**
- **Proven PCB Layout**
- **Fully Assembled and Tested**

Ordering Information appears at end of data sheet.

MAX34460 EV Kit Photo



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For pricing, delivery, and ordering information, please contact Maxim Direct at 1-888-629-4642, or visit Maxim Integrated's website at www.maximintegrated.com.

19-6334; Rev 0; 9/12

MAX34460 EV Kit Files

FILE	DESCRIPTION
MAX344XXEVKitSoftwareInstall.EXE	Application program

Note: *The .EXE file is downloaded as a .ZIP file.*

Quick Start

Required Equipment

- MAX34460 EV kit and hardware
- Windows XP or Windows 7 PC
- USB port
- Mini-USB cable (included)

Note: In the following sections, software-related items are identified by **bolding**. Text in bold refers to items directly from the install or EV kit software. Text in **bold and underlined** refers to items from the Windows operating system.

Procedure

The EV kit is fully assembled and tested. Follow the steps below to verify board operation:

1) Ensure that jumpers/shunts J23 and J1 are installed. **Note:** The GND planes of the USB I²C dongle and the EV kit are not connected. The GND jumper on J23 must be connected for proper communication.
2) Ensure that switches S1 and S2 are in the high position and S4, S5, and S6 are in the on position.
3) Set the EV kit hardware on a nonconductive surface to ensure that nothing on the PCB gets shorted together.
4) Prior to starting the GUI, connect the EV kit hardware to a PC using the supplied mini-USB cable, or equivalent. The power LED (D20) should be green and the com LED (D21) should be red and slowly flash orange.
5) Windows should automatically begin installing the necessary device driver. The USB interface of the EV kit hardware is configured as an HID device and therefore does not require a unique/custom device driver. Once the driver installation is complete, a Windows message appears near the **System Icon** menu indicating that the hardware is ready to use. Do not attempt to run the GUI prior to this message. If you do, then you must close the application and restart it once the driver installation is complete. On some versions of Windows, administrator privileges may be required to install the USB device.
6) Once the device driver installation is complete. Visit **www.maximintegrated.com/evkitsoftware** to download the latest version of the EV kit software, **MAX344XXEVKitSoftwareInstall.ZIP**. Save the EV kit software to a temporary folder.
7) Open the .ZIP file and double-click on the .EXE file to run the installer. A message box stating: **The publisher could not be verified. Are you sure you want to run this software?** may appear. If so, click **Yes**.
8) The installer GUI appears. Click **Next** and then **Install**. Once complete, click **Close**.
9) Go to **Start | All Programs**. Look for the **MAX344XXEVKitSoftware** folder and click on the MAX344XXEVKitSoftware.EXE file inside the folder.
10) When the GUI appears, the text at the bottom should display **EV Kit Hardware Connected**. The com LED (D21) on the EV kit board should turn green.

Detailed Description of Software

Software Startup

If the MAX34460 EV kit is connected when the software is opened, the software first initializes the hardware to communicate. Next, the software searches for all slave addresses on the I²C bus and connects to the first slave address that is valid. The model number is then read to see which device is connected. The GUI displays **EV Kit Hardware Connected** at the bottom.

If the EV kit is not connected on software startup, a **No Hardware** window pops up and asks the user to select the device they would like to run offline. Select a device and click **OK**. The GUI then populates with default EV kit values. Once the EV kit is connected, the GUI executes the sequence above.

Menu Items

The **File** menu item contains save, load, and exit options. To save the current GUI configuration, click **Save Project As**. This saves the device name and channel names to an XML file and saves PMBus configurations to a HEX file. If a device is connected, this reads and saves data directly from the device; otherwise, it saves the configuration that is currently displayed on the GUI. **Save Project** saves the GUI configuration to a file that was last saved or loaded. **Load Project** updates the GUI with the XML file, writes the HEX file to the device, and reads current values from the device. If a device is not connected, then the HEX file is written to a virtual device. The HEX file only contains data for the PMBus commands that are stored in flash. **Create Report** saves a CSV file that contains all the tables displayed on the **Sequencing**, **Monitoring**, and **Margining** tabs.

The **Connection** menu item allows the user to connect to a desired device. **Find Slave Addresses** searches for all slave addresses connected to the I²C bus. To select a device, click **Select Slave Address** and all the slave addresses found are shown and are selectable. Slave addresses 18h and 34h are not selectable to prevent communicating with the alert response address and factory-programmed address.

The **Auto Polling** menu item has options for automatic reading of the device. To start polling, select the delay between reads: **300ms**, **500ms**, **800ms**, or **1000ms**. Each poll reads the **Power Status** (STATUS_WORD 79h), **Fault Status** (STATUS_WORD 79h), and the polled values for the **Data Log Graph** tab. The **Status** and **Margining** tabs are only polled if the tab is currently selected. To stop polling, select **Off** from the menu. Polling can also be stopped by selecting items in the **File** menu, **Connection** menu, or by pressing buttons that involve action with the NV Fault Log or flash.

The **Device** menu item shows which device the tables and controls are configured for. To turn the power supplies on or off, select the **Power On**/**Power Off** button, which writes a value to the OPERATION (01h) command. The supplies power on with margining off and power off based on the **Power Down Action** drop-down list on the **Sequencing** tab. When the **GUI Lock** is on, all writing actions are disabled.

Status Log

The status log below the tabs displays all the actions the GUI performs. Whenever a PMBus command is read or written, the action is confirmed by the log. To save the log, press the **Save Log** button and the text in the box is saved to a .TXT file. The log can also be cleared by pressing the **Clear Log** button.

Sequencing Tab

The **Sequencing** tab sheet (Figure 1) includes all timing and alarm configurations. All values on the tab are read when the tab is selected. The channels can be set up in one or two groups by selecting the **Single** or **Dual** radio button under **Sequencing Mode**. When **Single** is selected, the **Group** column is forced to **Primary**. The channels can also be sequenced based on time or event by selecting the option from the **Sequencing Mode** drop-down list. If **PMBus (time-based)** is chosen, then the values under the **Timeslot** (MFR_SEQ_TIMESLOT D3h) column are all written to 0. The **Sequencing Mode** radio buttons and drop-down lists write to bits in MFR_MODE (D1h). The channels can be powered down simultaneously or with a TOFF delay by selecting the option in the **Power Down Action** drop-down list that writes to a bit in ON_OFF_CONFIG (02h). The **Fault Retry Time** sets the value in MFR_FAULT_RETRY (DAh). The **Output Type** writes to MFR_PSEN_CONFIG (D2h) to set the PSEN behavior. For the PSEN pin to act as a normal enable/disable for a power supply, select one of the PSEN options under **Output Type**. If a GPO option is selected, the channel is no longer a part of the sequencer, so the **Timeslot** and **TON Max** are written to 0 and all the channel configurations on the table become read-only. The timeslot for each channel can be set by selecting a value in the **Timeslot** column, which writes to MFR_SEQ_TIMSLOT (D3h). Note that these values can only be changed when the **Sequencing Mode** is set to **Timeslot (event-based)**. The **Group** column assigns the channel to the primary or secondary group by writing to a bit in MFR_SEQ_TIMESLOT (D3h). The sequencing delays can be set by writing values to **TON Delay** (TON_DELAY 60h), **TON Max** (TON_MAX_FAULT_LIMIT 62h), and **TOFF Delay** (TOFF_DELAY 64h). A channel can be set to global by checking the checkbox in the **Global** column to write to a bit in MFR_FAULT_RESPONSE (D9h). Alarm 0 and Alarm 1 can be configured to turn on for different faults by selecting an option in the **ALARM0/1 Pin Config** column that writes to bits in MFR_FAULT_RESPONSE (D9h). The **Fault Response** column writes to the TON Max Fault response bits in MFR_FAULT_RESPONSE (D9h). To log faults into the NV fault log, check the checkbox in the **Log Faults** column that writes to MFR_FAULT_RESPONSE (D9h).

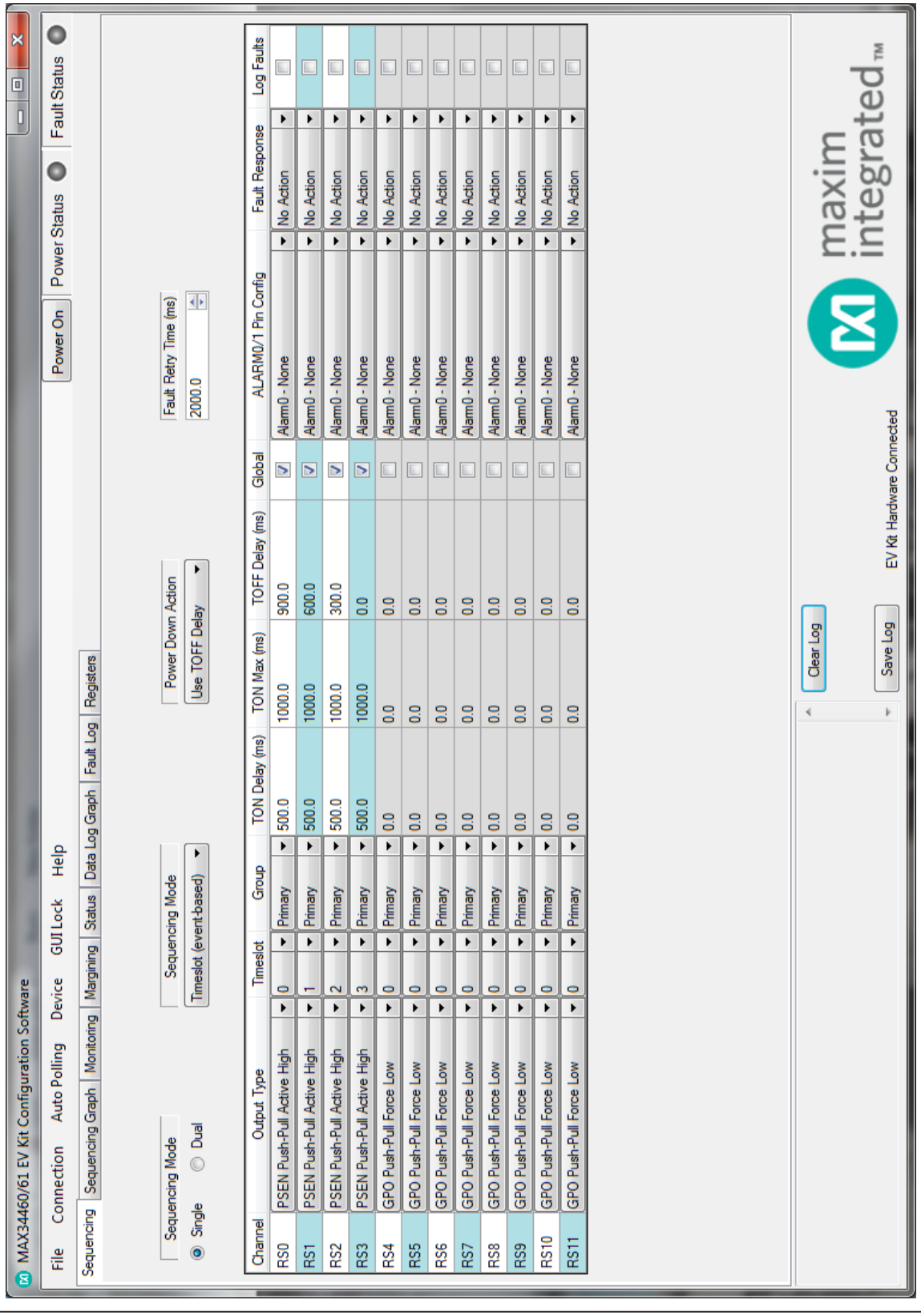

Figure 1. MAX34460 EV Kit GUI (Sequencing Tab)

Sequencing Graph Tab

The **Sequencing Graph** tab sheet (Figure 2) displays the timing diagrams for all the channels. When the **Power Up** radio button is selected, the **TON Delay** (TON_DELAY 60h) and **TON Max** (TON_MAX_FAULT_LIMIT 62h) values are displayed on the graph. To change the **TON Delay**, click and drag the green vertical bar; to change **TON Max**, click and drag the red vertical bar. The **Power Down** graph displays the **TOFF Delay** (TOFF_DELAY 64h) and can be changed by clicking and dragging the green vertical bar. These values write to the PMBus command when the mouse is released. The **Power Up** graph can be changed to **PMBus (time-based)** or **Timeslot (event-based)** by selecting the option on the **Sequencing** tab (Figure 1). When **Timeslot (event-based)** is selected, the power-up graph allows the **Timeslot** (MFR_SEQ_TIMSLOT D3h) to be changed by clicking and dragging the ramp.

Monitoring Tab

The **Monitoring** tab sheet (Figure 3) displays the fault/warn limit settings for each channel and for each temperature sensor. To read the settings, click on the **Monitoring** tab and all the values are automatically read. To write to a value, click on the corresponding cell, type in a valid value, and either click another cell or press Enter on the keyboard. In the **VOLTAGE** table, the **Sequencer** column shows the status of the channel and is read only. To turn on or off the sequencer, select a PSEN or GPO option, respectively, on the **Sequencing** tab (Figure 1) under the **Output Type** column. The **Nominal** and **Resistive Ratio** columns are calculated based on a nominal ADC level of 1.8V to set the VOUT_SCALE_MONITOR (2Ah). The **Resistive Ratio** is found by dividing 1.8V by the **Nominal** value. The fault/warn limits can be set by entering the voltage level or the percent of the nominal in the **UV Fault** (VOUT_UV_FAULT_LIMIT 44h), **UV Warn** (VOUT_UV_WARN_LIMIT 43h), **OV Warn** (VOUT_OV_WARN_LIMIT 42h), **OV Fault** (VOUT_OV_FAULT_LIMIT 40h), **PG On** (POWER_GOOD_ON 5Eh), and **PG Off** (POWER_GOOD_OFF 5Fh) columns. The **Fault Response** column writes to the OV and UV fault response bits in MFR_FAULT_RESPONSE (D9h). To write to the OT fault response bits in MFR_FAULT_RESPONSE (D9h), check the checkbox in the **OT Fault** column and it sets the same response selected in the **Fault Response** column. To log faults into the NV fault log, check the checkbox in the **Log Faults** column to write to MFR_FAULT_REPSPONSE (D9h). In the **TEMPERATURE** table, the sensors can be enable/disabled in the **Enable** column, which writes to a bit in MFR_TEMP_SENSOR_CONFIG (F0h). The OT warn/fault limits can be set by entering a value in the **OT Warn** (OT_WARN_LIMIT 51h) or **OT Fault** (OT_FAULT_LIMIT 4Fh) columns.

The power-good delay can be adjusted with the **PG Delay** up/down spin box, which writes to MFR_PG_DELAY (DBh). The **Watchdog Configuration** section sets up the external watchdog and reads/writes to bits in MFR_WATCHDOG_CONFIG (FDh).

Margining Tab

The **Margining** tab sheet (Figure 4) includes the margin configurations, margin fault status, and a DAC calculator for the DS4424. All values on the tab are read when the tab is selected. The **Margin** column turns the margin on/off by writing to the OPERATION (01h) command. To force all the channels to the same margin, select the state in the **Margin All Control** drop-down list to the right of the table. The **Slope**, **Open Loop**, and **DAC Value** columns configure the DS4424 and are read from bits in the MFR_MARGIN_CONFIG (DFh) command. The margining limits can be set by entering the voltage level or the percent of the nominal in the **Margin Low** (VOUT_MARGIN_LOW 26h) and **Margin High** (VOUT_MARGIN_HIGH 25h) columns. When the margining is turned on, the fault status is shown in the **Status** column read from STATUS_MFR_SPECIFIC (80h). The **Polled** column displays the current channel voltage read from READ_VOUT (8Bh). To read the **Status** and **Polled** values, press the **Read Status and Vout** button or turn on **Auto Polling**. The margin fault can be cleared by pressing the **Clear Faults** button on the **Status** tab (Figure 5).

The **Calculator** is used to find the DS4424 external resistor (R_{FS}), which determines the full-scale and step-size current for the DAC. If R_{FS} is calculated to be outside its limits ($40k\Omega < R_{FS} < 160k\Omega$), then the resistor is forced to the edge of the limit and the **DS4424 RFS** edit box turns red. The equations used to calculate the outputs are given in Table 1.

Table 1. DAC Calculator

OUTPUT EQUATIONS
IFB = $(V_{OUT})/(R1 + R2)$
DS4424 RFS = $(7.75)/(I_{FB}$ x margining range$)$
DS4424 full scale = $(0.976 \times 127)/(16 \times R_{FS})$
DS4424 step size = full scale/64

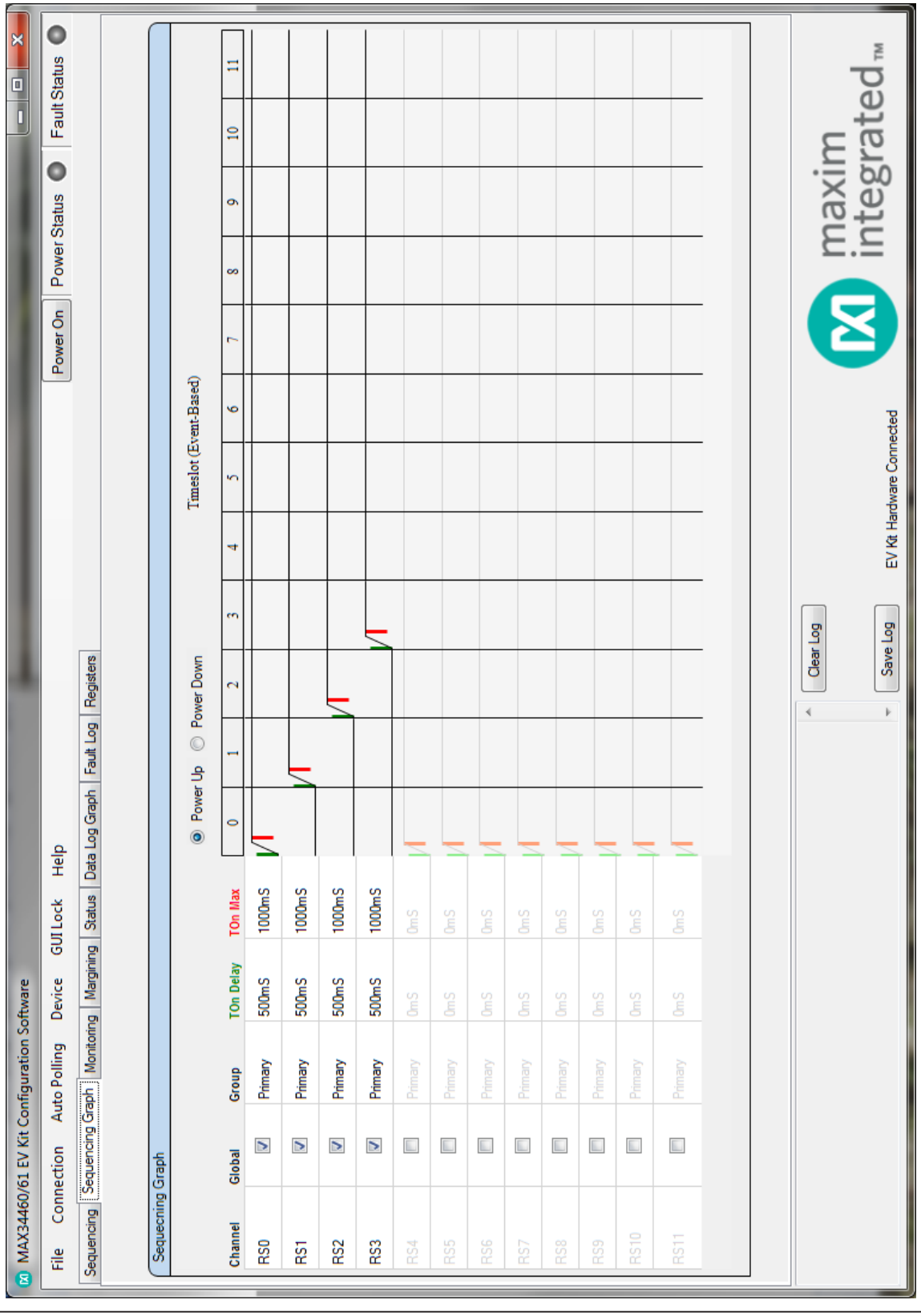

Figure 2. MAX34460 EV Kit GUI (Sequencing Graph Tab)

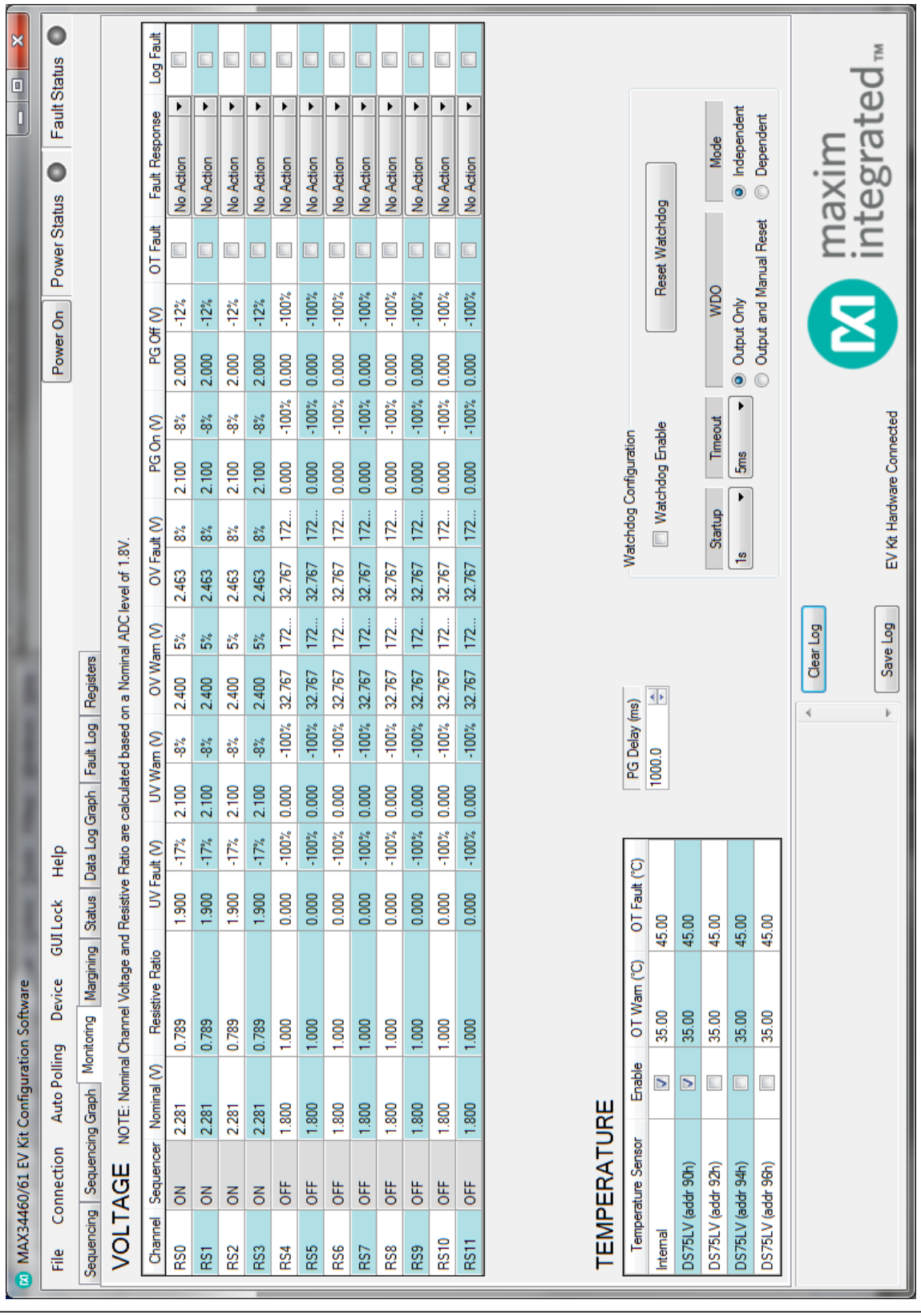

Figure 3. MAX34460 EV Kit GUI (Monitoring Tab)

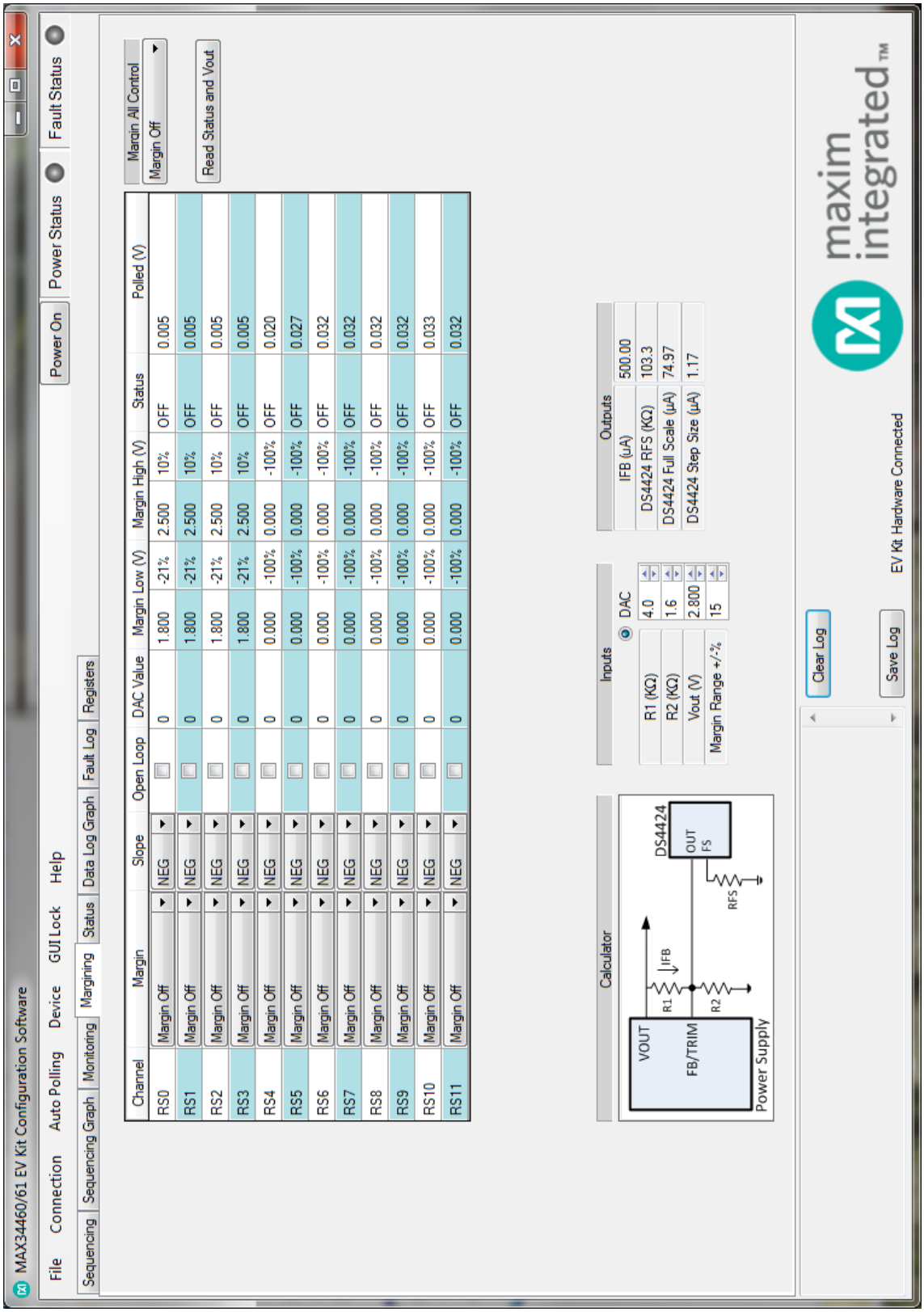

Figure 4. MAX34460 EV Kit GUI (Margining Tab)

Status Tab

The **Status** tab sheet (Figure 5) displays all the faults, warnings, and device ID information. To read all the current output values, faults, and warnings, press the **Read Status** button or turn on **Auto Polling**. The fault and warning bits are read from STATUS_VOUT (7Ah), STATUS_MFR_SPECIFIC (80h) and STATUS_TEMPERATURE (7Dh). The **Polled** values are read from READ_VOUT (8Bh) and READ_TEMPERATURE (8Dh). Each color indicator turns green if the status is good, red if there is a fault, or yellow to indicate a warning. The **Polled** value may not reflect the fault or warning because some bits are latches and have to be cleared. To clear the faults and warnings, press the **Clear Faults** button, which sends the CLEAR_FAULTS (03h) command. The alarm faults are also latches and have to be cleared by pressing the **Clear Alarm** button to set a bit in MFR_MODE (D1h). The **Time Count** displays the 32-bit counter read from the MFR_TIME_COUNT (DDh) command. This timer can be reset by pressing the **Reset Time Count** button, which writes a sequence of all zeros, all ones, and all zeros to MFR_TIME_COUNT (DDh). The **ID COMMANDS** table displays all the ID information of the device. Press the **Read ID** button to read all the commands in the table.

Data Log Graph Tab

The **Data Log Graph** tab sheet (Figure 6) plots the polled values in a graph and keeps track of the minimum and maximum values for each channel voltage and each temperature sensor. To read and plot the polled values, press the **Data Log Read** button or turn on **Auto Polling**. Each data log reads every channel's voltage from READ_VOUT (8Bh) and every temperature sensor from READ_TEMPERATURE (8Dh). The software finds the minimum and maximum values over multiple reads. The **Poll Count** displays the number of reads that have been tracked in the data log. When the polled count reaches 10,000, the graph deletes the oldest polled values and adds a new polled value. The min/max values are still based on all the poll count values, but the graph only displays the latest 10,000 polled values. To reset the **Poll Count** and all the minimum and maximum values, press the **Data Log Reset** button. To turn off data logging during polling, check the **Data Log Off** checkbox. The **Select Data** combo box is used to select the voltage or temperature data to display on the graph and in the **MIN/MAX Data** table. To save all the data graphed to a CSV file, press the **Save Data Log** button.

Fault Log Tab

The **Fault Log** tab sheet (Figure 7) displays the **NV Fault Log** and fault configurations. When the tab is selected, the **Overwrite** and **Fault Log Depth** are read. When the fault log is full, the **Enable Overwrite** can be checked to automatically overwrite previous logs. The fault log depth can be adjusted with the **Fault Log Depth** combo box. The **Enable Overwrite** and **Fault Log Depth** are read from bits in MFR_NV_LOG_CONFIG (D8h). To read the fault log, press the **Read NV Fault Log** button and all 255 bytes from MFR_NV_FAULT_LOG (DCh) are displayed in the table. To clear or force the fault log, press the **Clear NV Fault Log** or **Force NV Fault Log** button, respectively. These buttons write to a bit in MFR_NV_LOG_CONFIG (D8h). To save the current fault log displayed in the table, press the **Dump to a File** button and the table is saved as a CSV file.

Registers Tab

The **Registers** tab sheet (Figure 8) displays all the PMBus commands and their current data. To read the registers, select a page from the top drop-down list and all the PMBus commands valid for that page are automatically read. The commands not valid for that page are grayed out. Press the **Read All** button to read the registers again. To write to a command, enter the hex value in the cell and click another cell or press Enter on the keyboard. The current register configuration can be saved to flash by pressing the **Save to Flash** button, which sends the STORE_DEFAULT_ALL (11h) command. To return the device to the configuration saved in flash, press the **Restore from Flash** button, which sends the RESTORE_DEFAULT_ALL (12h) command. To reset the device, press the **Soft Reset** button to write to a bit in MFR_MODE (D1h). The **Calculate CRC** button sends the RESTORE_DEFAULT_ALL (12h) command and then calculates a 2-byte CRC based on PMBus configuration commands that are stored in flash. The **Read CRC from MFR_DATE** button reads MFR_DATE (9Dh) and displays the upper 2 bytes in the edit box below the button. The **Calculate CRC & Write to MFR_DATE** button sends the RESTORE_DEFAULT_ALL (12h) command, calculates a CRC, writes the CRC to the upper 2 bytes of MFR_DATE (9Dh), and sends STORE_DEFAULT_ALL (11h) command. The **Command Description** displays the bitmap for selected PMBus commands. Select the command from the drop-down list and the table below displays a description of each bit for that command.

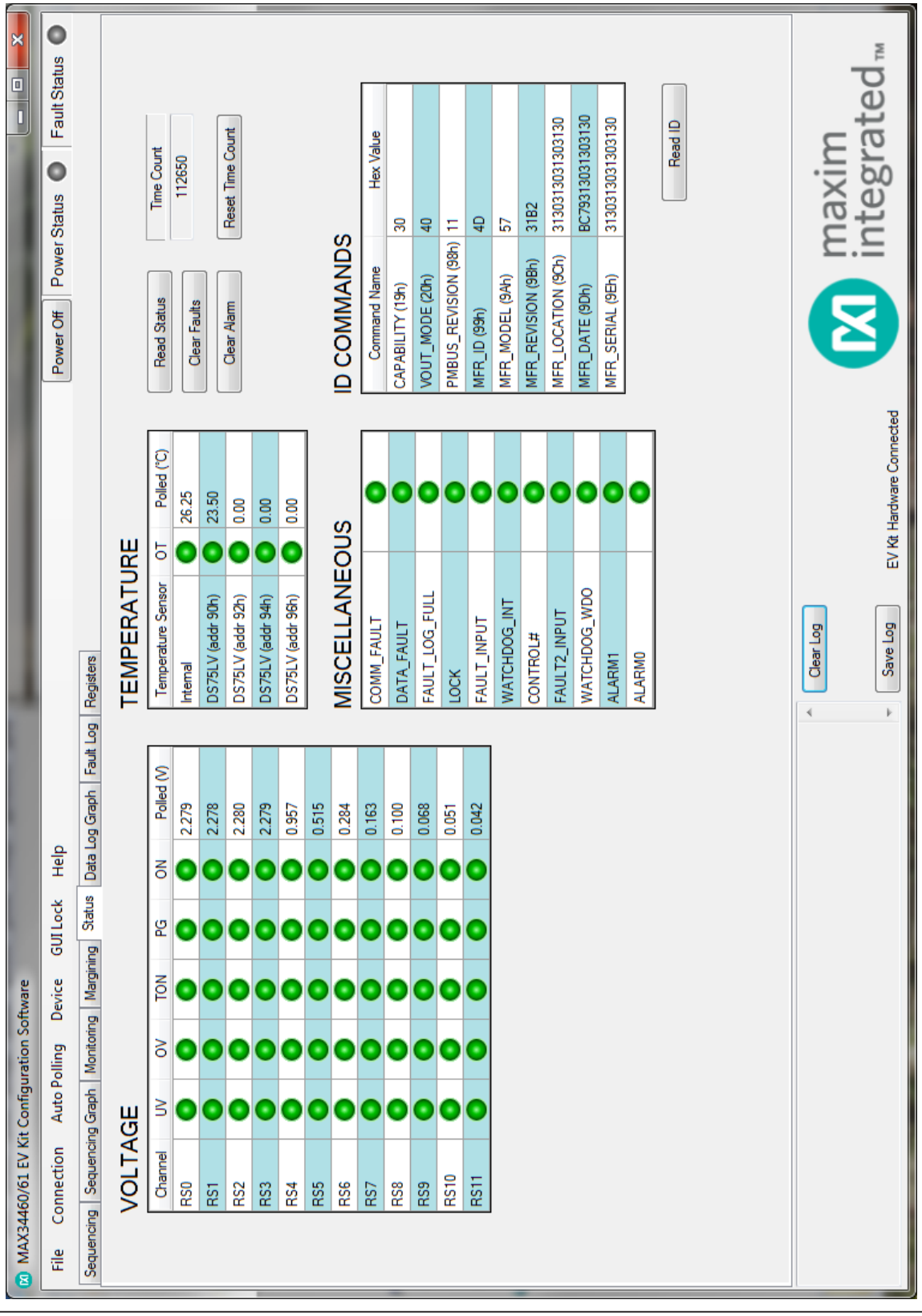

Figure 5. MAX34460 EV Kit GUI (Status Tab)

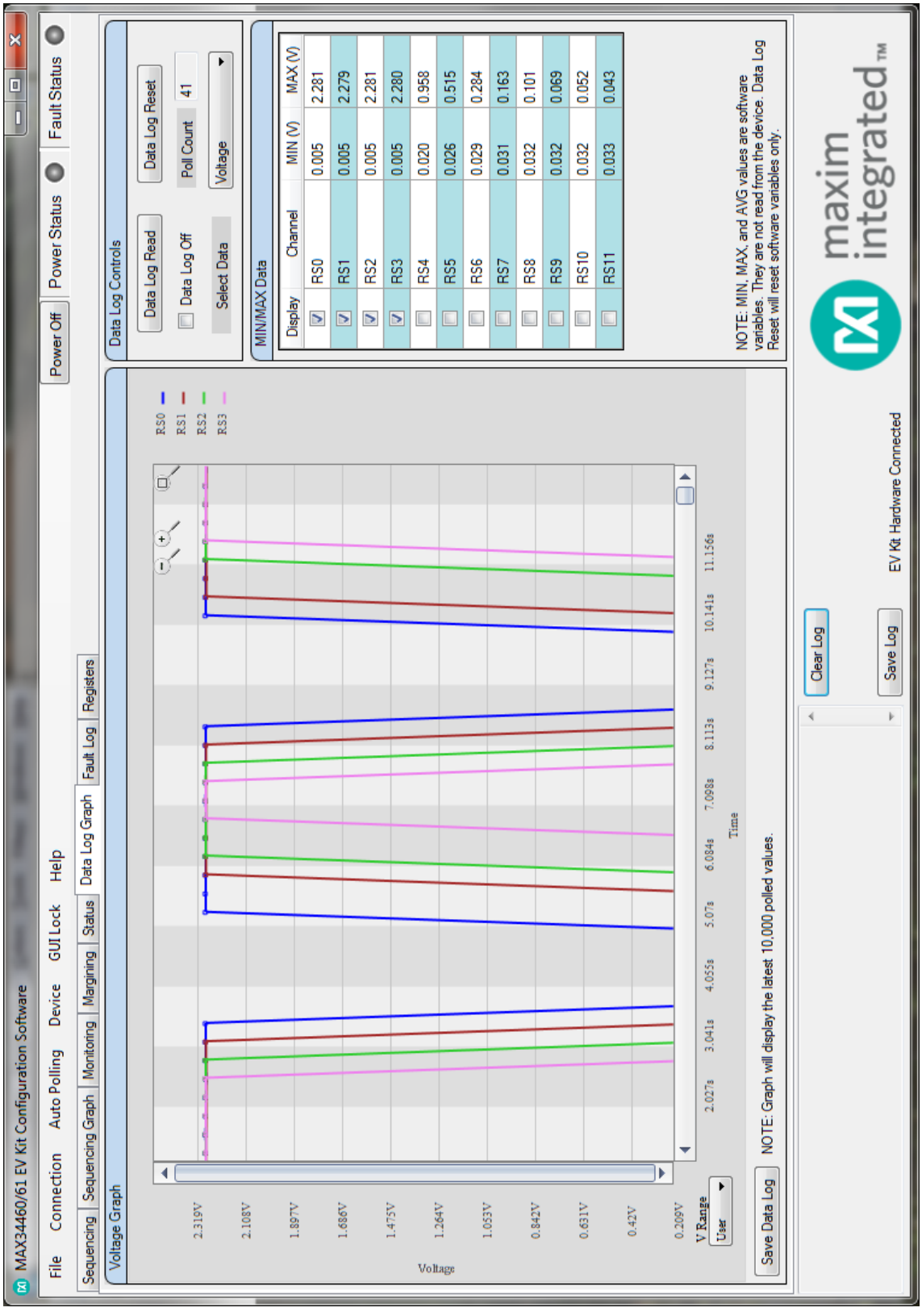

Figure 6. MAX34460 EV Kit GUI (Data Log Graph Tab)

Figure 7. MAX34460 EV Kit GUI (Fault Log Tab)

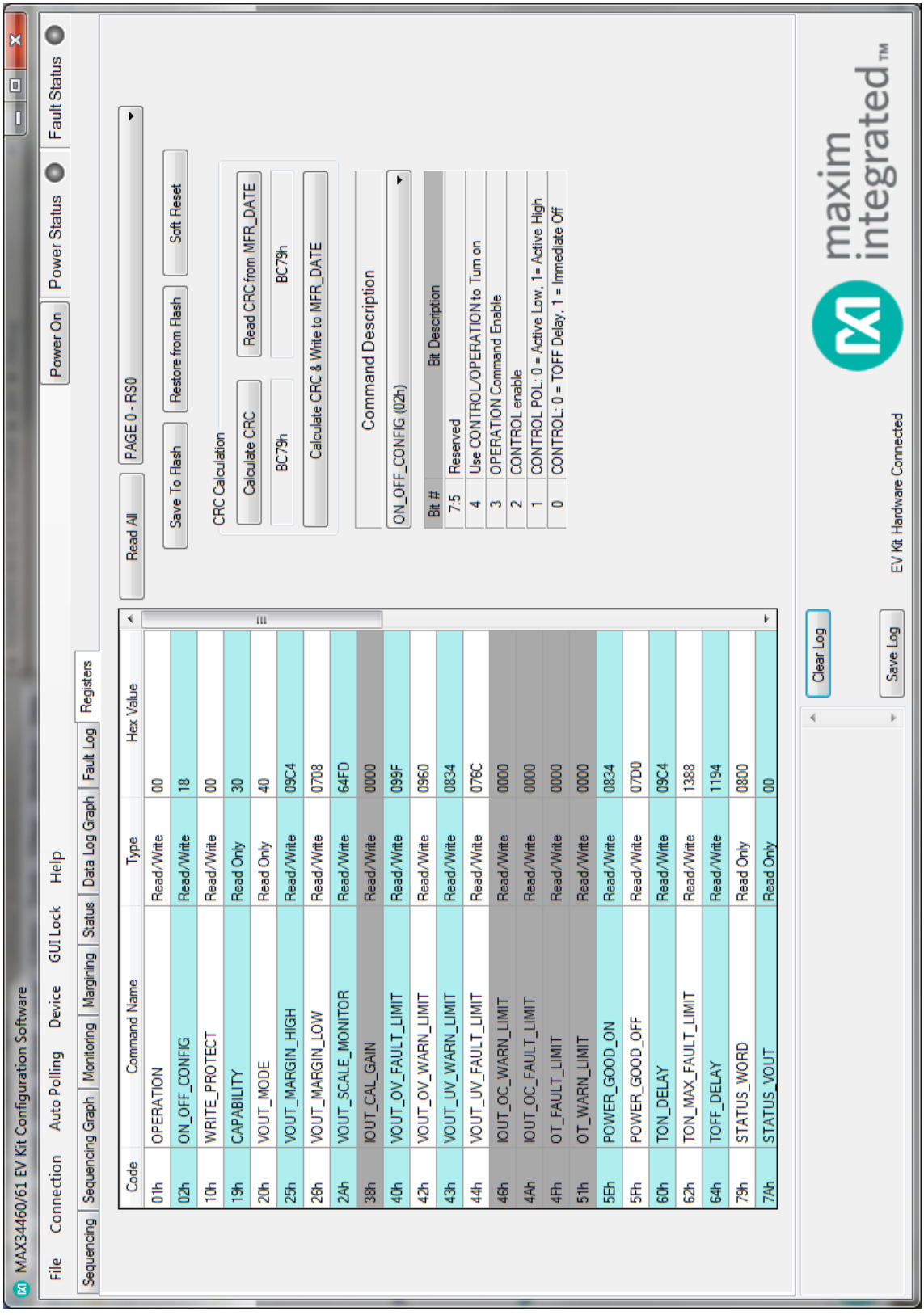

Figure 8. MAX34460 EV Kit GUI (Registers Tab)

Detailed Description of Hardware

User-Supplied I²C Interface

To communicate with the MAX34460 using a user-supplied I²C interface, first remove the J23 jumper to disconnect the USB I²C dongle. If the dongle is no longer desired, it can be separated from the EV kit by snapping the PCB at the scored line. Connect test points SDA, SCL, GND, and 5V to the off-board I²C interface. The I²C interface should operate at 3.3V.

User-Supplied Power Supplies

To disconnect the on-board power supplies, turn the DAC (S4), RS (S5), and PSEN (S6) DIP switches off. The power supplies' GND should be connected to the banana jack GND. Connect the desired PSEN pins to the enable pin on the power supply, and the RS pins to a voltage-divider on the output of the power supply. The voltage-divider is only required if the output voltage is greater than 1.8V. For closed-loop margining with the on-board DS4424, connect DAC0–DAC3 to the feedback of the power supply channels 0–3.

User-Supplied DS4424

To margin with a user-supplied DS4424, disconnect the on-board current DAC by switching the DAC (S4) DIP switch to off. Then connect MSDA, MSCL, and GND on J3 to the external current DAC. The slave address for the user-supplied DS4424 should be 60h for power-supply channels 4–7 or A0h for channels 8–11. The on-board DS4424 has slave address 20h, which margins channels 0–3.

User-Supplied DS75LV

To use an off-board digital temperature sensor, connect MSDA, MSCL, and GND on J3 to the DS75LV. The slave address for the user-supplied DS75LV should be 92h, 94h, or 96h. The on-board DS75LV has slave address 90h.

Troubleshooting

All efforts were made to ensure that each kit works on the first try, right out of the box. In the rare occasion that a problem is suspected, see Table 5 to help troubleshoot the issue.

Table 2. Description of LEDs

LED	COLOR	DESCRIPTION
D2	Red	Fault: A shutdown fault occurred for a global primary group.
D3	Red	Fault 2: A shutdown fault occurred for a global secondary group.
D4	Red	Watchdog Output (WDO): Watchdog timeout has occurred.
D5	Green	Power Good 2 (PG2): All enabled channels for the secondary group are above their associated power-good on value.
D6	Green	Power Good (PG): All enabled channels for the primary group are above their associated power-good on value.
D7	Red	Alert: A fault has occurred.
D8	Red	Alarm1: Configurable on the *Sequencing* tab (Figure 1).
D9	Red	Alarm0: Configurable on the *Sequencing* tab (Figure 1).
DA	Red	VOUT0: Channel 0 is on.
DB	Red	VOUT1: Channel 1 is on.
DC	Red	VOUT2: Channel 2 is on.
DD	Red	VOUT3: Channel 3 is on.
D20 (Power)	Red	USB Power Fault: A fault occurred due to overvoltage limit, current limit, or thermal limit.
	Green	USB Power: USB power supply is on.
D21 (Com)	Red	Communication: After the software has initialized the hardware, the LED flashes red when an I²C command is received.
	Green	Initialized: Hardware has been initialized by software.

Table 3. Description of Switches

SWITCH		SWITCH POSITION	DESCRIPTION
S1		High*	Control: Pulls the control pin high.
		Low	Control: Pulls the control pin low.
S2		High*	Control 2: Pulls the control 2 pin high.
		Low	Control 2: Pulls the control 2 pin low.
S3		Pressed	Reset: Pulls the reset pin low to reset the MAX34460.
S4	1	On*	DAC0: Connects DAC0 of DS4424 to FB0 of the channel 0 power supply.
	2	On*	DAC1: Connects DAC1 of DS4424 to FB1 of the channel 1 power supply.
	3	On*	DAC2: Connects DAC2 of DS4424 to FB2 of the channel 2 power supply.
	4	On*	DAC3: Connects DAC3 of DS4424 to FB3 of the channel 3 power supply.
S5	1	On*	RS0: Connects RS0 of MAX34460 to the channel 0 power supply.
	2	On*	RS1: Connects RS1 of MAX34460 to the channel 1 power supply.
	3	On*	RS2: Connects RS2 of MAX34460 to the channel 2 power supply.
	4	On*	RS3: Connects RS3 of MAX34460 to the channel 3 power supply.
S6	1	On*	PSEN0: Connects PSEN0 of MAX34460 to the channel 0 power supply.
	2	On*	PSEN1: Connects PSEN1 of MAX34460 to the channel 1 power supply.
	3	On*	PSEN2: Connects PSEN2 of MAX34460 to the channel 2 power supply.
	4	On*	PSEN3: Connects PSEN3 of MAX34460 to the channel 3 power supply.

**Default position.*

Table 4. Description of Jumpers

JUMPER	JUMPER POSITION	DESCRIPTION
J1	VDD-VDUT	MAX34460 Power: Connects VDD to VDUT (MAX34460).
J23	5V-5V	5V: Supplies 5V from the USB I²C dongle to the EV kit board.
	SDA-SDA	SDA: Connects SDA from the USB I²C dongle to the MAX34460 SDA.
	GND-GND	GND: Connects GND from the USB I²C dongle to the EV kit board GND.
	SCL-SCL	SCL: Connects SCL from the USB I²C dongle to the MAX34460 SCL.

Table 5. Troubleshooting

SYMPTOM	CHECK	SOLUTION
GUI says hardware not found.	Is the LED labeled D20 red?	If yes, then the electronic fuse (U7) is in a fault state. Inspect for electrical shorts on the PCB and make sure that the PCB is not sitting on a conductive surface.
	Does the LED labeled D21 turn green when the GUI is running?	If not, then exit the GUI and try running it again. If D20 still does not turn green, then exit the GUI and try connecting the USB cable to a different USB port on the PC and wait for a Windows message that states the hardware is ready to use. Run the GUI again.
	Are any of the LEDs illuminated?	If not, then the PCB may not be getting power from the USB. Try a different USB cable or a different USB port.
No slave address found and read/writes fail	Jumper J1	Make sure jumper J1 is installed to power the MAX34460.
	Jumper J23	Make sure 4 jumpers on J23 are installed.
Channels do not turn on	Is there a CONTROL# fault on the Status Tab of the GUI?	Default configuration Control is active high. Make sure S1 and S2 are in the high position
	Is the ALERT LED on and all channel LEDs off?	If so, make sure switch PSEN (S6) is in the on position to connect the PSENs of MAX34460 to the channels.
	Is the ALERT LED on and Channel 0 LED on?	If so, make sure switch RS (S5) is in the on position to connect the power-supply outputs to the MAX34460.
Margining is not working, voltage is not changing	S4	Make sure the DAC (S4) switch is in the on position to connect the DACs from DS4424 to FB of channels 0–3

Component List

DESIGNATION	QTY	DESCRIPTION
C0A–C0D, C2A–C2D, C20, C22, C25, C201, C202, C204	14	10µF, X5R ceramic capacitors (0805) Taiyo Yuden EMK212ABJ106KD-T
C01, C05, C211	3	1µF, X7R ceramic capacitors (0805) Murata GRM21BR71A105KA01K
C06	0	Capacitor, do not populate
C1A–C1D, C04, C21, C24, C203, C214	9	0.01µF, X7R ceramic capacitors (0805) TDK C2012X7R1H103KT
C02, C03, C07–C11, C212	8	0.1µF, X7R ceramic capacitors (0805) TDK CGJ4J2X7R1H104K
C23	0	Do not populate, 470µF aluminum capacitor
C213	1	220nF, X7R ceramic capacitor (0805) TDK CGJ4J2X7R1H224K
C215	0	Do not populate, ceramic capacitor (0805)
D1, D22	2	Schottky diodes Panasonic DB2W31900L

DESIGNATION	QTY	DESCRIPTION
D2, D3, D4, D7, D8, D9, DA–DD	10	Red LEDs (1206) Kingbright APTR3216EC
D5, D6	2	Green LEDs (1206) Lumex SML-LX1206GC-TR
D20, D21	2	Red/green dual LEDs Kingbright APHB M2012SURKCGKC
J1	1	2-pin header, 2.54mm pitch 961102-6404-AR
J2, J22	2	4-pin headers, 2.54mm pitch 961104-6804-AR
J3	1	3-pin header, 2.54mm pitch 961103-6404-AR
J4	1	Black banana jack (GND) 571-0100
J5–J12, J21	0	Do not populate, headers
J20	1	5-pin female USB-mini header 54819-0519
J23	1	8-pin (2 x 4) header 961104-6804-AR
Q1, Q2	2	60V, 340mA nMOSFETs (SC70) ON Semi 2N7002WT1G

Component List (continued)

DESIGNATION	QTY	DESCRIPTION
R0–R11, R16, R17, R36, R37, R102, R107, R108, R117, R201, R202, R214	23	0Ω ±1% resistors (0805) Vishay CRCW08050000Z0EA
R0A–R0D, R77, R79–R91, R103, R109, R112, R113, R119, R123, R125, R127, R133, R135, R136, R204	29	100kΩ ±1% resistors (0805) Vishay CRCW0805100KFKEA
R1A–R1D	4	8.66kΩ ±1% resistors (0805) Vishay CRCW08058K660FKEA
R2A–R2D	4	3.09kΩ ±1% resistors (0805) Vishay CRCW08053K09FKEA
R101, R116, R161, R164, R207	5	10kΩ ±1% resistors (0805) Vishay CRCW080510K0FKEB
R3A–R3D	4	49.9Ω ±1% resistors (0805) Vishay CRCW080549R9FKEA
R4A–R4D	4	267Ω ±1% resistors (0805) Vishay CRCW0805267RFKEA
R5A–R5D	4	1kΩ ±1% resistors (0805) Vishay CRCW08051K00FKEA
R20–R31, R40–R51, R76, R78, R110, R121, R132, R134, R162, R215, R216	0	Do not populate, resistors (0805)
R56–R59	4	150kΩ ±1% resistors (0805) Vishay CRCW0805150KFKEA
R100, R130, R131, R210	4	4.7kΩ ±1% resistors (0805) Vishay CRCW08054K70FKEA
R104, R114, R118, R120, R124, R126, R128, R137, R211, R212	10	330Ω ±1% resistors (0805) Vishay CRCW0805330RFKEA
R105, R106, R213	3	2.2kΩ ±1% resistors (0805) Vishay CRCW08052K20FKEA
R111, R122	2	330kΩ ±1% resistors (0805) Vishay CRCW0805330KFKTA
R115	1	4kΩ ±1% resistor (0805) Vishay CRCW08054K00FKTA
R160, R163, R206	3	45.3kΩ ±1% resistors (0805) Vishay CRCW080545K3FKEA
R203, R205	2	560Ω ±1% resistors (0805) Vishay CRCW0805560RFKEA
S1, S2	2	Slide-switch SPDTs SLS121PC04
S3	1	Single-pole pushbutton KSR221G LFS
S4, S5, S6	3	4-pole DIP switches BD04
TP1	10	Red test points Keystone 5010
TP2–TP6, TP9, TP10, TP11	8	Black test points Keystone 5011
TP7, TP44	2	Orange test points Keystone 5013
TP8, TP43	2	Yellow test points Keystone 5014
TP12–TP42, TP50	32	White test points Keystone 5012
U1	1	PMBus 12-channel voltage monitor (48 TQFN-EP*) Maxim MAX34460ETM+
U1A–U1D, U4, U5, U22	7	500mA LDO regulators, (8 TDFN-EP*) Maxim MAX8902BATA+
U2	1	Digital temperature sensor (8 SO, 150 mil) Maxim DS75LVS+
U3	1	4-channel sink/source current DAC (14 TDFN-EP*) Maxim DS4424N+
U20	1	Microcontroller (28 SO) Microchip PIC18LF2550-I/SO
U21	1	50mA, -600mA current-limit switch (6 SOT23) Maxim MAX4995AAUT+
X1	1	48MHz, 3.3V oscillator (SMD) AVX KC3225A48.0000C30E00
—	5	Jumpers/shunts
—	1	Mini-USB cable
—	1	PCB: MAX34460 EV Kit

**EP = Exposed pad.*

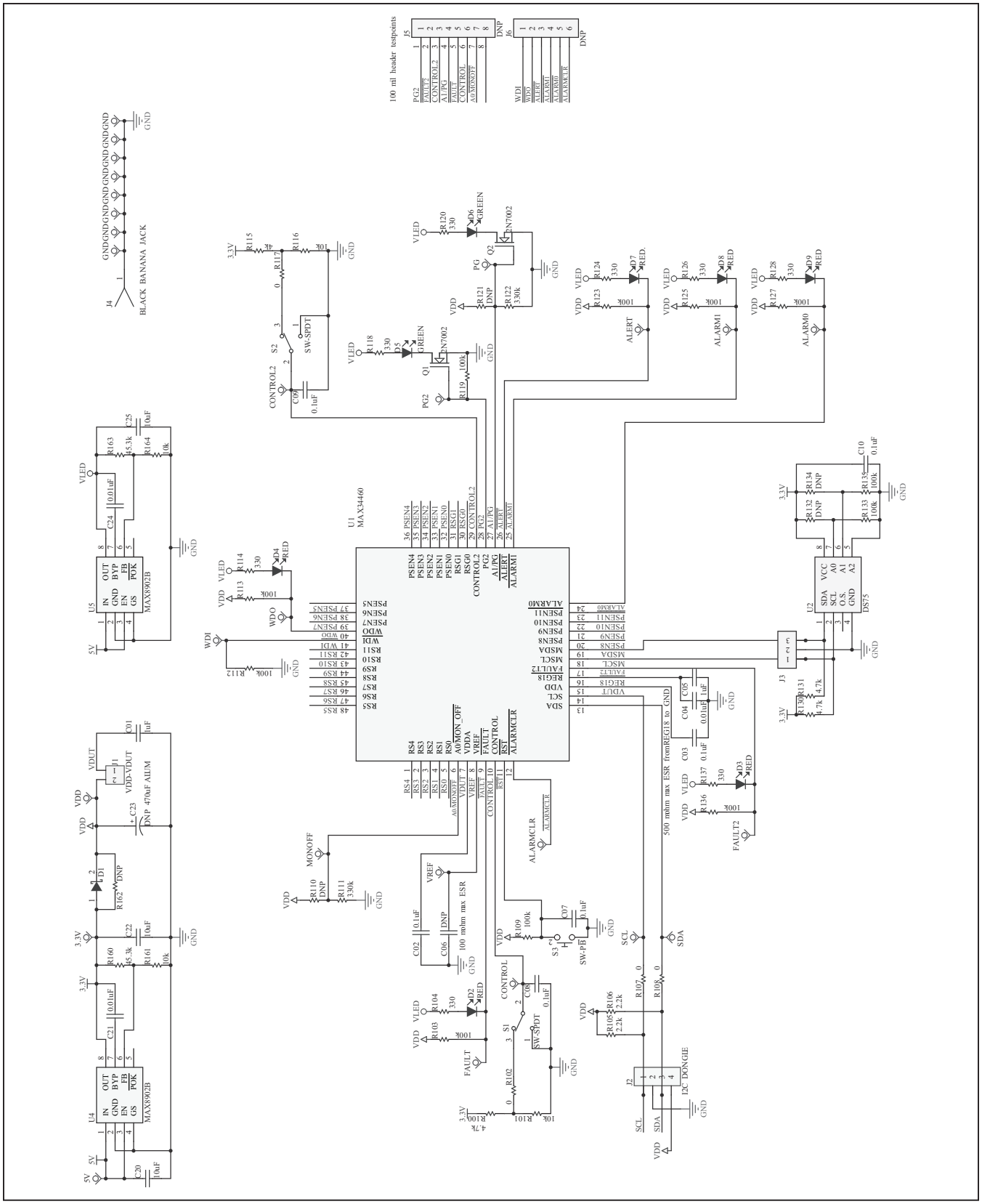

Figure 9a. MAX34460 EV Kit Schematic (Sheet 1 of 3)

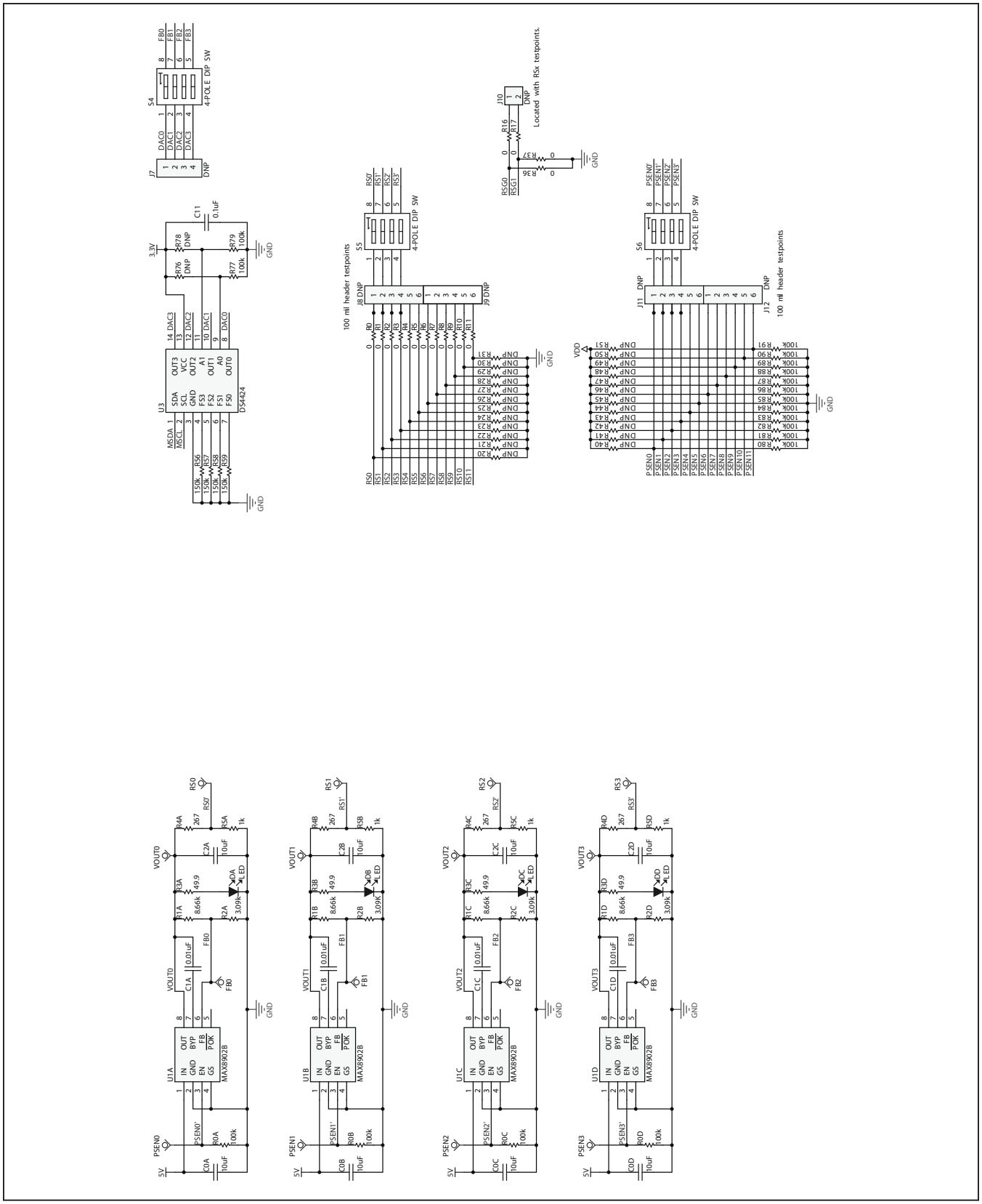

Figure 9b. MAX34460 EV Kit Schematic (Sheet 2 of 3)

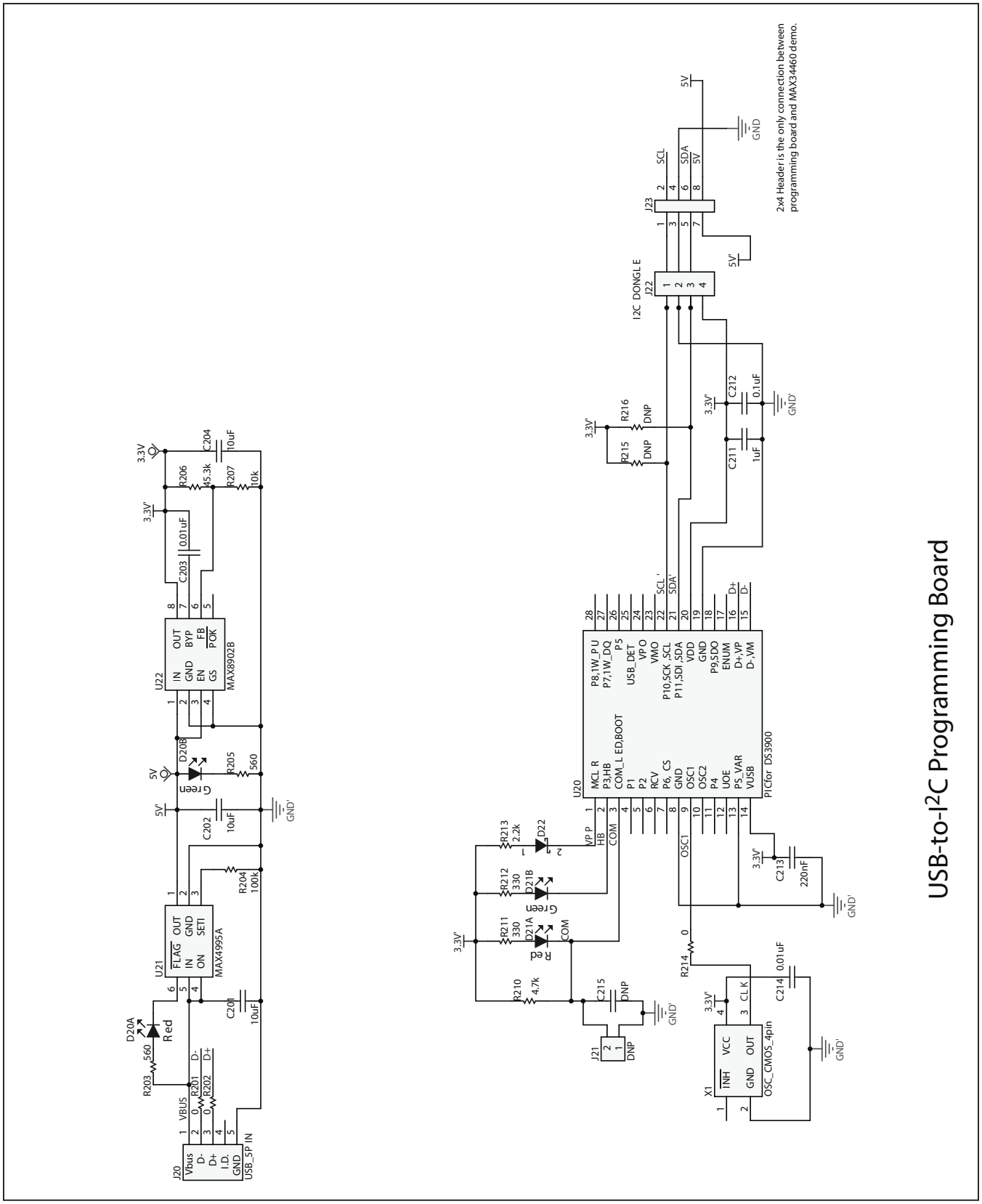

Figure 9c. MAX34460 EV Kit Schematic (Sheet 3 of 3)

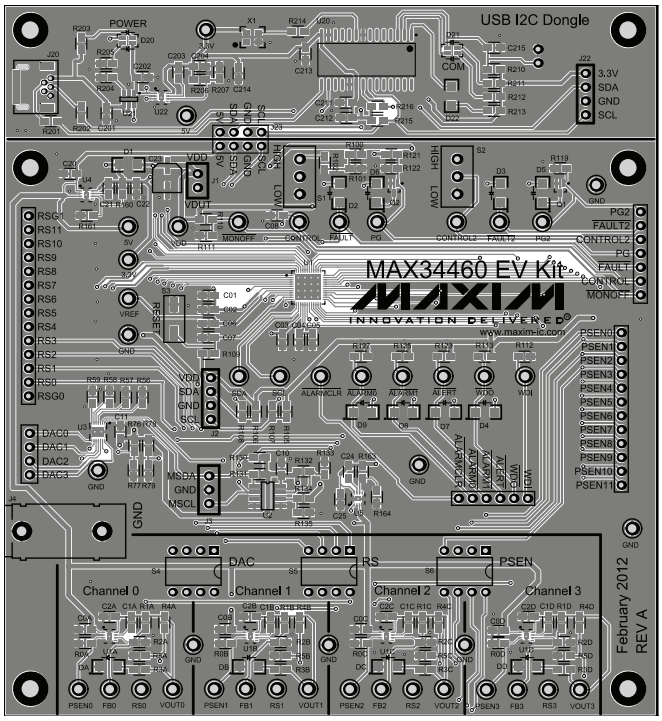

Figure 10. MAX34460 EV Kit PCB Layout—Top

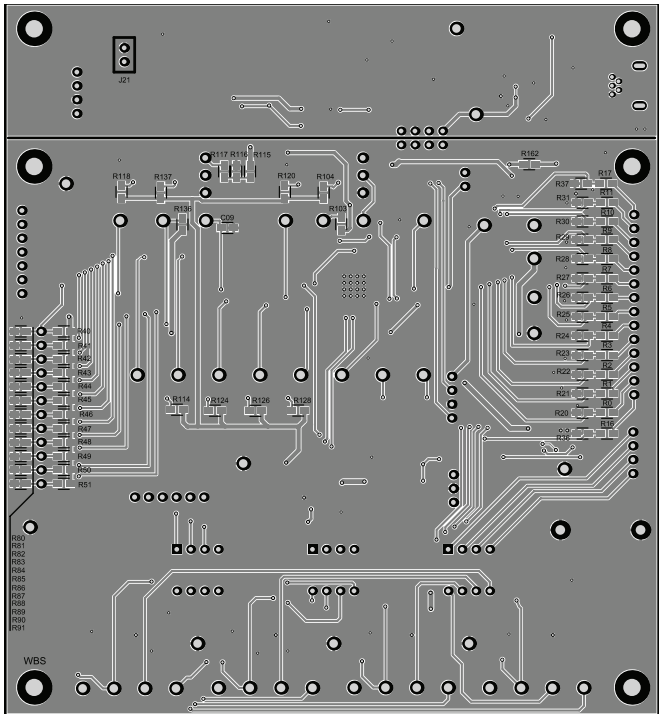

Figure 11. MAX34460 EV Kit PCB Layout—Bottom

Ordering Information

PART	TYPE
MAX34460EVKIT#	EV Kit

#Denotes an RoHS-compliant device that may include lead(Pb) that is exempt under the RoHS requirements.

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	9/12	Initial release	—

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Телефон: 8 (812) 309-75-97 (многоканальный)
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Web: http://oceanchips.ru/
Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А