Evaluates: MAX20356

MAX20356 Evaluation Kit

General Description

The MAX20356 evaluation kit (EV kit) is a fully assembled and tested circuit for evaluating the MAX20356 power-management solution designed for ultra-low-power wearable applications.

A flexible set of power-optimized voltage regulators, including 3 x buck converters, a buck-boost converter, 4 x linear regulators, including an RTC LDO, and 3 x load switches, provide a high level of integration and the ability to create a fully optimized power architecture. Refer to the MAX20356 IC data sheet for detailed information regarding the operation and features of the devices.

The device is configurable through an I^2C interface that allows for programming various functions and reading device status. The EV kit GUI application sends commands to the MAXPICO2PMB# adapter board to configure the device.

The EV kit comes standard with the MAX20356 EV kit version IC installed.

Features

- USB-Power Option
- Flexible Configuration
- On-Board Battery Simulation
- Sense Test Point for Output-Voltage Measurement
- Windows® 8/Windows 10-Compatible Graphical User Interface (GUI) Software
- Fully Assembled and Tested

EV KIT Contents

- MAX20356_EVKIT_A System
- MAXPICO2PMB# board
- Two USB A to USB micro-B cables

MAX20356 EV Kit Files

FILE	DESCRIPTION
MAX20356EVKitSetupVxxx.exe	PC GUI Program

Ordering Information ***appears at end of data sheet.***

Quick Start

Required Equipment

- MAX20356 EV kit
- Windows PC with USB ports
- One USB A-to-USB Micro-B cable and PICO2PMB adapter board with the latest firmware
- One USB A-to-USB Micro-B cable or power supply (for battery simulation or battery voltage)
- One USB A-to-USB Micro-B cable or power supply (for charger)
- One voltmeter

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

Procedure

The EV kit is fully assembled and tested. Follow the steps to install the EV kit software, make required hardware connections, and start operation of the kit.

1. Visit *www.maximintegrated/evkitsoftware* under the *Tools and Simulations* tab to download the latest version of the MAX20356 EV kit software. MAX20356EVKitSetupVxxx.zip is located on the MAX20356 EV kit web page. Save the software to a temporary folder and unpack the zip file.
2. Install the EV kit software on the computer by running the **MAX20356EVKitSetupVxxx.exe** program inside the temporary folder. This copies the program files and creates an icon in the Windows **Start** menu. The software requires the .NET Framework 4.5 or later. If connected to the internet, Windows automatically updates the .NET Framework as needed.
3. The EV kit software launches automatically after installation, and it can be launched by clicking on its icon in the Windows **Start** menu.
4. Verify that all jumpers are in their default positions, as shown in *Table 1*.
5. Make sure JP7 and JP20 are not installed until all connections have been verified.
6. Connect the type-A end of a cable to the PC and the micro-USB end of a cable to the MAXPICO2PMB# board, and connect the MAXPICO2PMB# to J3 located on the top left of the EV kit board.

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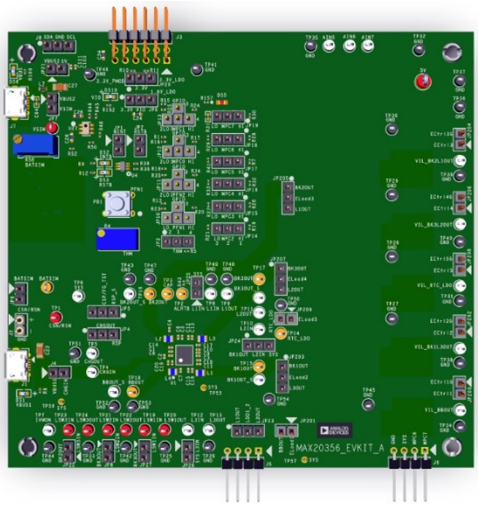
7. Connect a USB A to micro-B cable from the computer to J7 on the upper left corner of the EV kit board to use VBUS2 to power the battery simulation circuits on the board.
8. Reinstall JP7 and JP20.
9. Use a voltmeter to check VSIM test point is approximately 5V; BATSIM test point is approximately 3.7V. To adjust the BATSIM voltage, connect DMM to BATSIM TP and turn the R58 BATSIM potentiometer.
10. On the computer, open the MAX20356 GUI. The status bar at the bottom shows **MAX20356 Not Found**, as shown in *Figure 1*. The IC is in Seal mode.
11. Set DMM to measure voltage and connect the positive lead to TP6, SYS and ground lead to any GND TP.
12. Hold PFN1 button for ~4s to power on the device and measure VSYS
    ~ 3.7V
13. The MAX20356EVKIT should be powered on, and the status of the EV kit Tool now shows **Connected**, and the registers are read and displayed *Figure 2.*
14. The EV kit is now ready for additional evaluation.
15. To evaluate the battery charger, shunt J4 and plug in the USB micro-B cable to J1 of the EV kit to use USB VBUS power, or externally supply the charging power on TP4 CHGIN.

MAX20356 EV Kit Photo



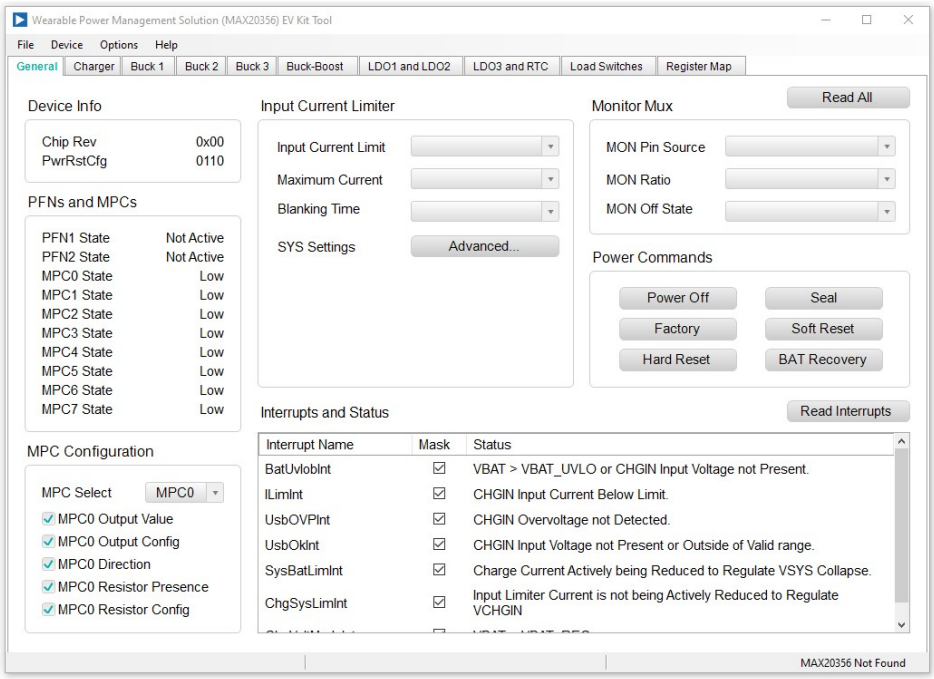


Figure 1. MAX20356 Not Found Status

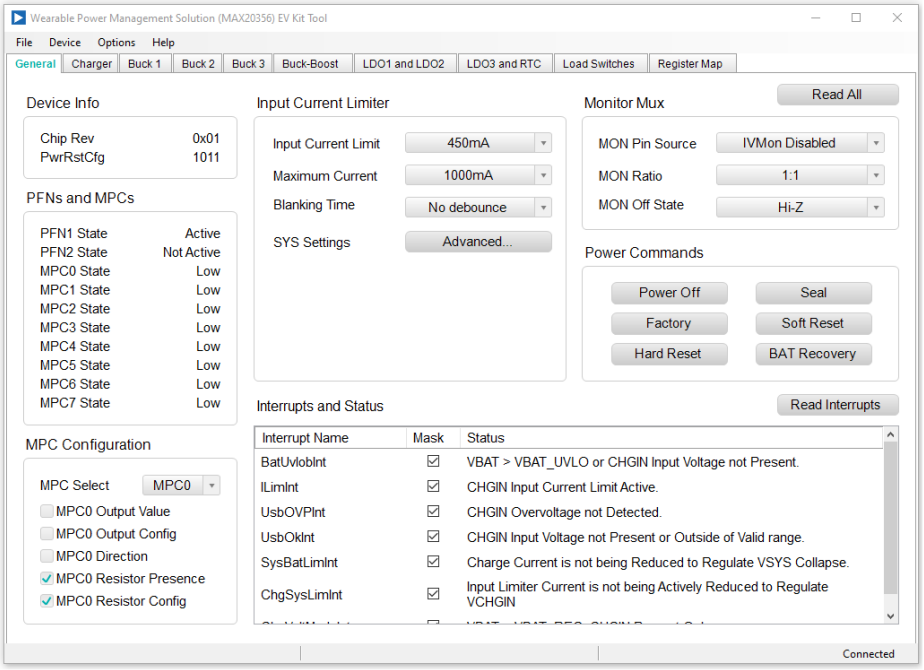


Figure 2. Connected Status

Detailed Description of Software

Software Startup

Upon starting the program, the EV kit software automatically searches for the USB interface circuit and then for the IC device addresses. The EV kit enters the normal operating mode when the connection is established and addresses are found. If the USB connection is not detected, the status bar displays **Not Connected**. If the USB connection is detected, but the MAX20356 is not found, the status bar shows **MAX20356 Not Found.**

ToolStrip Menu Bar

The **ToolStrip** menu bar (*Figure 3*) is located at the top of the GUI window. This bar comprises **File**, **Device**, **Options**, and **Help** menus; each function is detailed in the following sections.

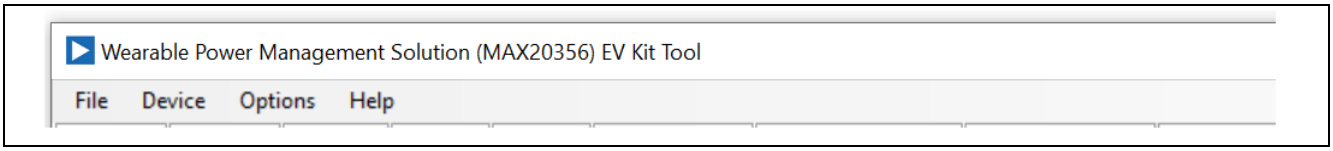


Figure 3. The ToolStrip Menu Items

File Menu

The **File** menu contains the option to exit out of the GUI program.

Device Menu

The **Device** menu provides the ability to connect or disconnect the EV kit to the GUI. The **Advanced → I2C Read/Write** menu allows the user to read from or write to a selected register with a specified slave address. The **Advanced → Use USB2PMB2#** option should be checked if using with the USB2PMB2# adapter board.

Options Menu

The **Options** menu provides several settings to access additional features offered by the GUI. The **Disable Polling** option allows registers to be read manually instead of receiving automatic frequent register updates from the IC. The **Lock/Unlock** option allows for the lock or unlock of the bucks, buck-boost, LDOs, LSWs, charger, watchdog, and rail sequence through I^2C.

Help Menu

The **Help** menu contains the **About** option, which displays the GUI splash screen indicative of the GUI version being used.

Tab Controls

The MAX20356 EV kit software GUI provides a convenient way to test the features of the MAX20356. Each tab contains controls relevant to various blocks of the device. Changing these interactive controls triggers a write operation to the MAX20356 to update the register contents. The **Read All** button reads all the configuration registers that are visible on the current tab page. The **Interrupts and Status** section in each tab shows the state of the status registers and their corresponding interrupts. Checking or unchecking the **Mask** option controls which interrupts cause the $\overline{INT}$ output to be pulled low when asserted.

Click the **Read Interrupts** button to read and clear the interrupts visible in the current tab. Asserted interrupts are denoted by bold text in the **Interrupt Name**. All statuses are polled continuously. The polling feature can be disabled in the **Options** section of the menu bar by selecting **Disable Polling**.

General Tab

The **General** tab (*Figure 4*) provides information on device info, PFNs and MPCs status, and configuration. Charger input current and voltage limit setting, IVMON setting, power commands, and some general interrupts and status are also found under this tab.

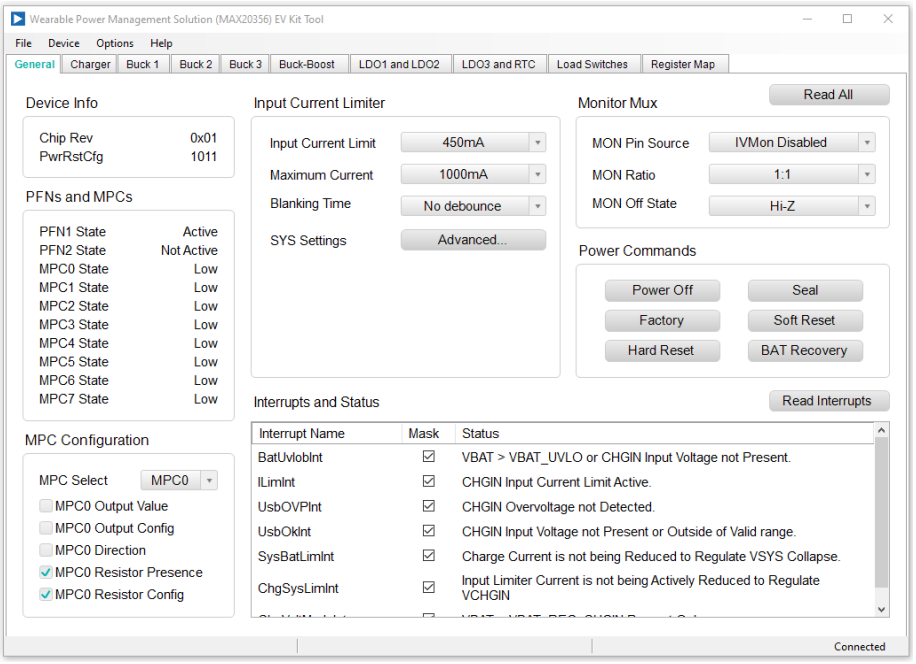


Figure 4. General Tab

Charger Tab

The **Charger** tab (*Figure 5*) provides options to set charger voltage, current, and timer in different charging states. The thermistor monitor configuration can be accessed by clicking the **Advanced** button.

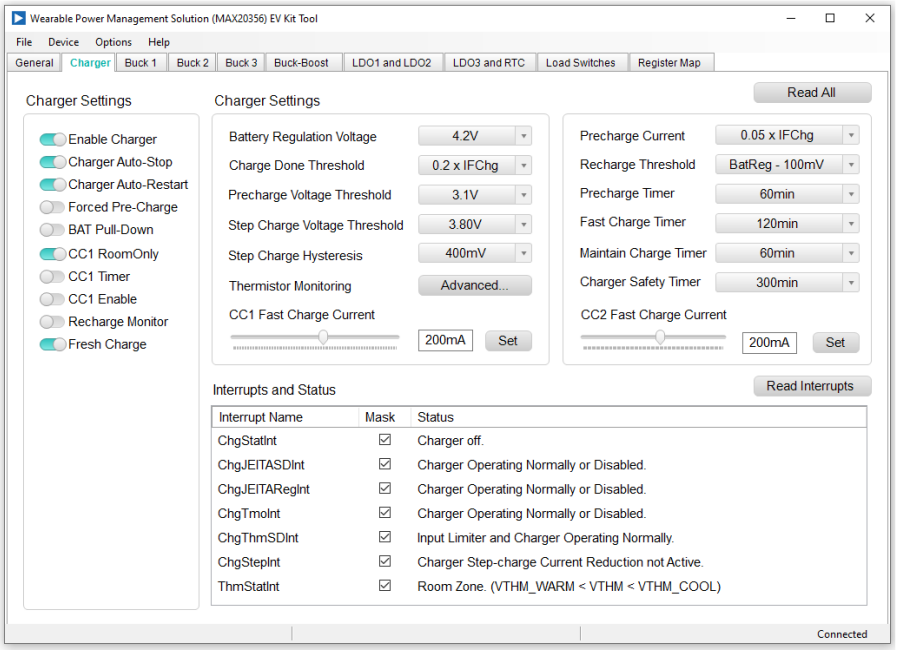


Figure 5. Charger Tab

Buck1/2/3, Buck-Boost Tab

The **Buck1**, **Buck2**, **Buck3**, and **Buck-Boost** tabs (*Figure 6*, *Figure 7*, *Figure 8* and *Figure 9*) provide options to enable buck/buck-boost, set output voltages, inductor current settings, DVS mode, voltage setting, and some additional settings.

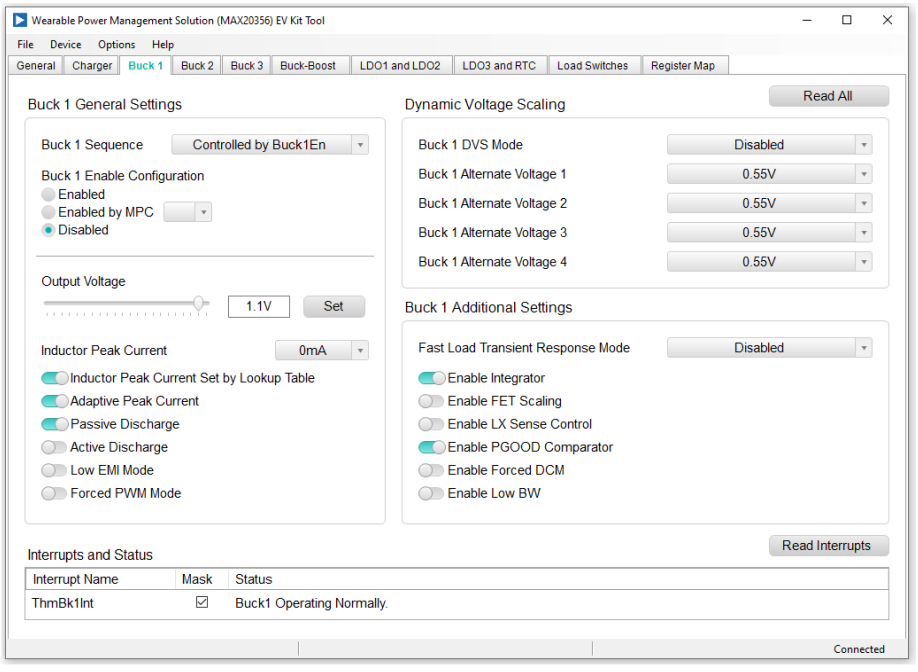


Figure 6. Buck1 Tab

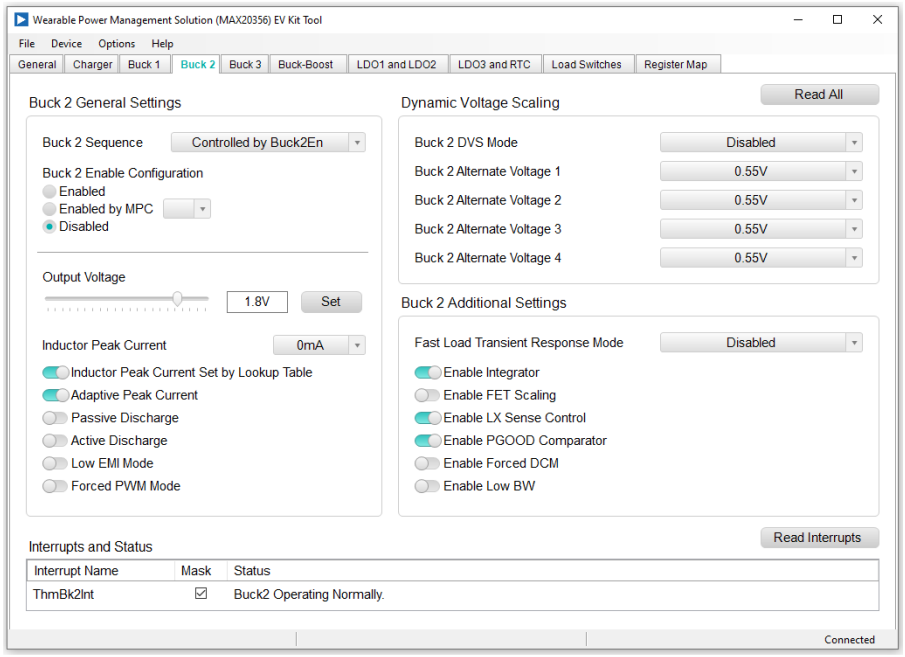


Figure 7. Buck2 Tab

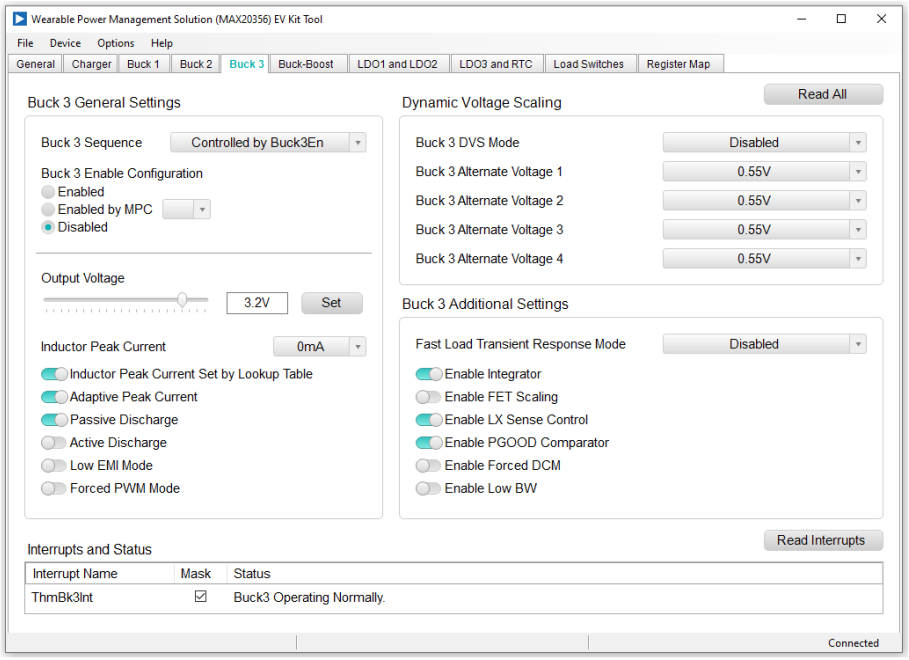


Figure 8. Buck3 Tab

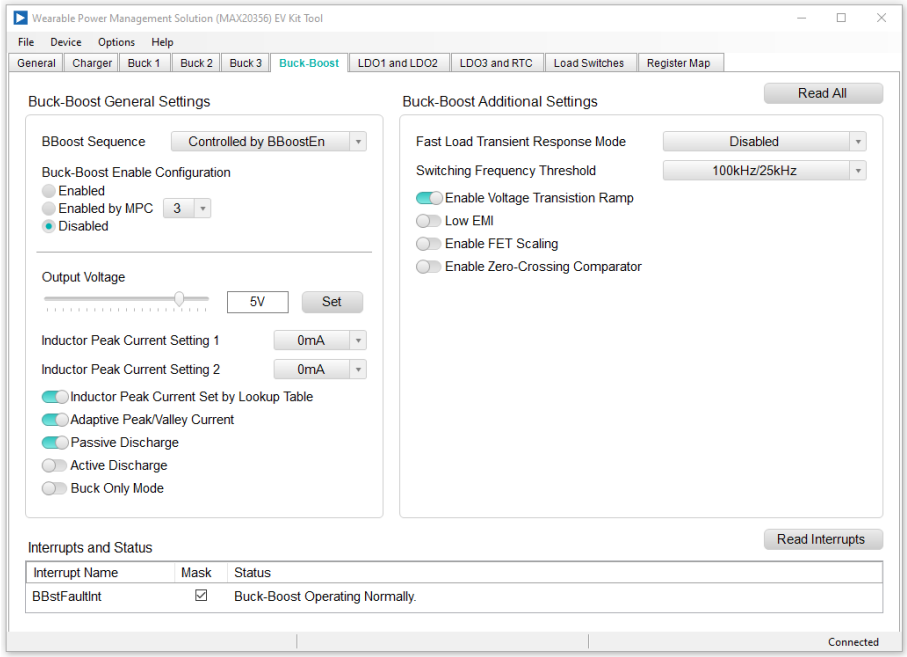


Figure 9. Buck-Boost Tab

LDO1/2/3 and RTC LDO Tab

The **LDO1 and LDO2**, and **LDO3 and RTC** (*Figure 10* and *Figure 11*) provide options to enable LDOs, set LDO voltage, and change other LDO settings.

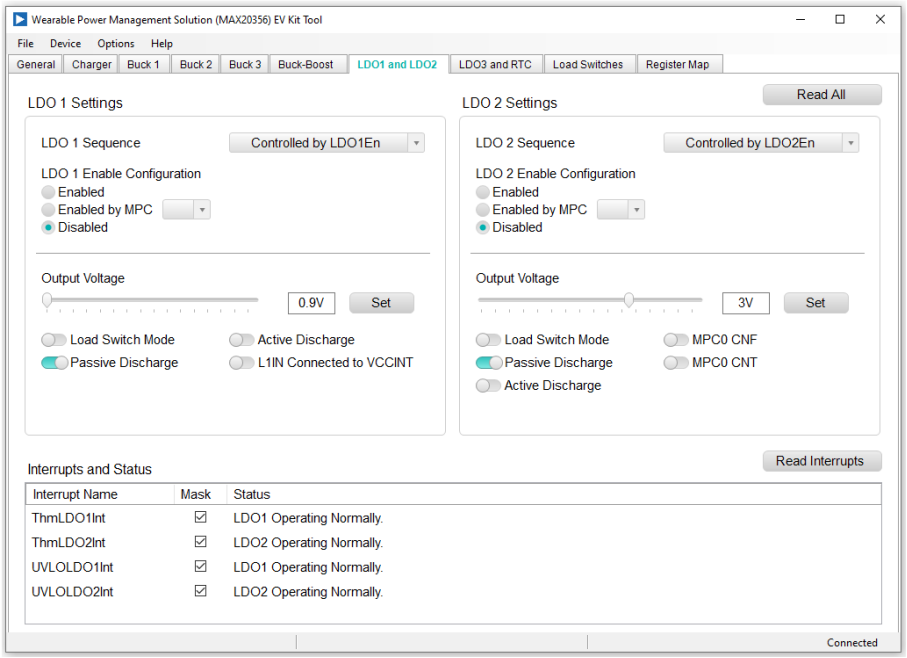


Figure 10. LDO1 and LDO2 Tab

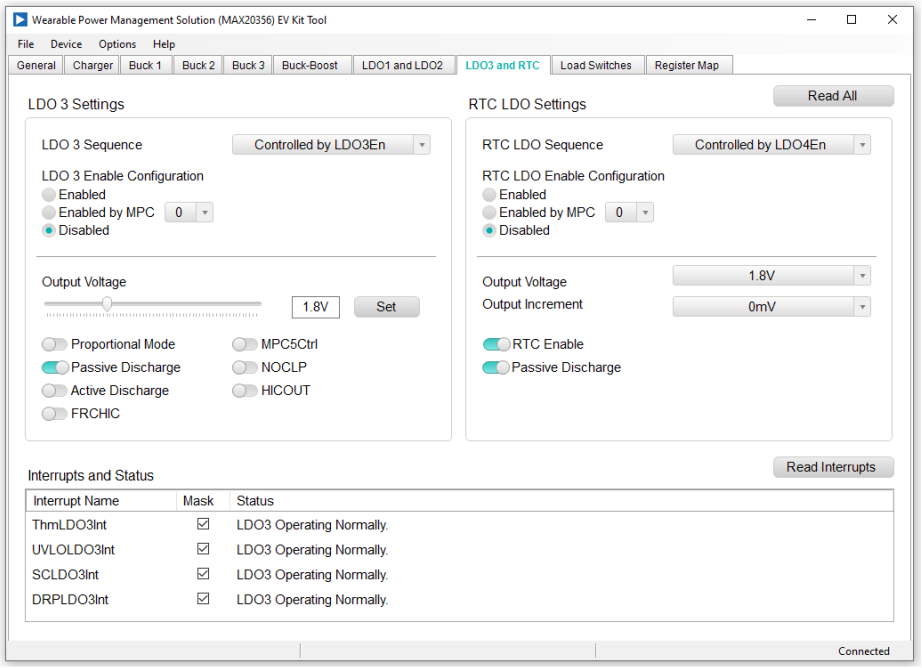


Figure 11. LDO3 and RTC Tab

Load Switches Tab

The **Load Switches** tab (*Figure 12*) includes Load Switch 1, Load Switch 2, and Load Switch 3 settings.

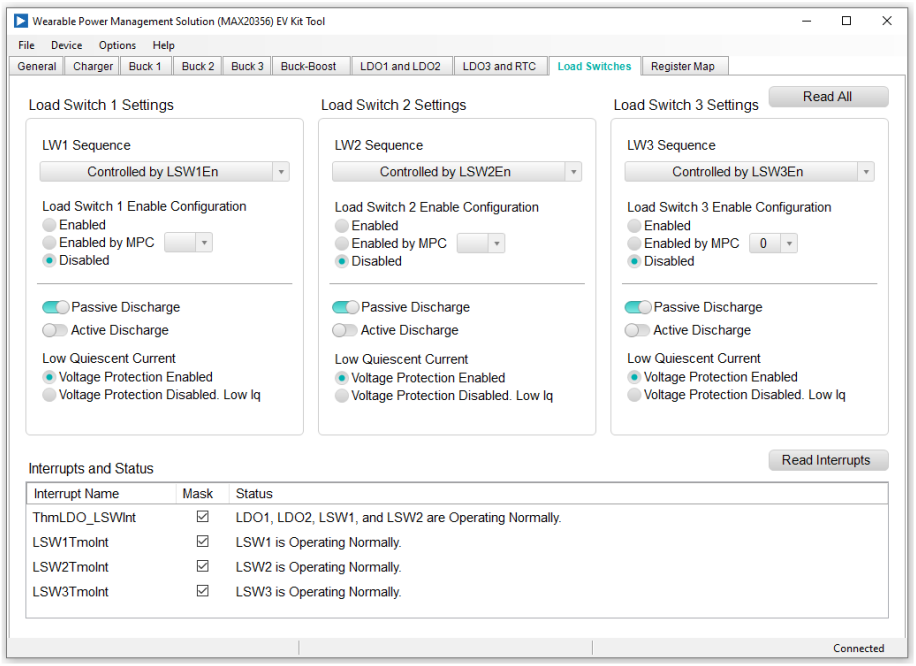


Figure 12. Load Switches Tab

Register Map Tab

The **Register Map** tab (*Figure 13*) provides all names and values of the MAX20356 registers. Click **Read All** in the top right corner to perform a burst read of all registers.

The left table shows the register to be read from and written to. The right table contains descriptions for each register field of the selected 8-bit register. All bits, along with their field names, are displayed at the bottom of the page.

To set a bit, click the bit label. **Bold** text represents logic 1, and regular text represents logic 0. To configure the changes to the device, click the **Write** button at the bottom right.

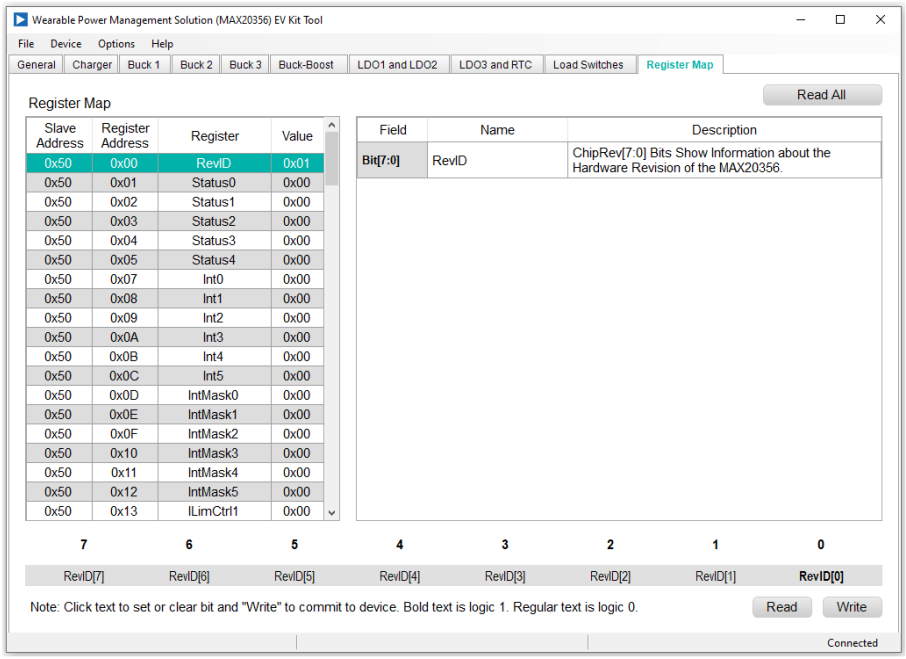


Figure 13. Register Map Tab

Detailed Description of Hardware

The MAX20356 EV kit evaluates the MAX20356 ultra-low-power wearable PMIC, which communicates over the I2C interface. The EV kit demonstrates the IC features such as bucks, buck-boost, linear regulators, load switches, and a battery charger. The EV kit uses the IC in a 63-bump wafer-level package on a proven, six-layer PCB design. The EV kit can use USB VBUS 5V DC for battery and charger input power source. Alternatively, the EV kit can be powered from an external power supply. *Figure 14* shows the EV kit block annotated picture.

Hardware Setup

To use the EV kit with the EV kit software, connect the MAXPICO2PMB# to the PMOD connector in the top left corner of the board. The MAXPICO2PMB# also provides 3.3V to the logic voltage VIO of the EV kit when shunting 1-2 in a JP20. The user can use the J7 USB VBUS to power the battery simulation circuits on the EV kit to supply the BAT of the IC. Turning the R58 potentiometer can change the BATSIM voltage. Connect BATSIM to the BAT of the IC with a shunt on JP9. Alternatively, instead of using battery simulation circuits on the board, the user can connect a Li-ion battery to the J2 connector. The user can use the J1 USB VBUS as a CHGIN source and place a shunt on J4.

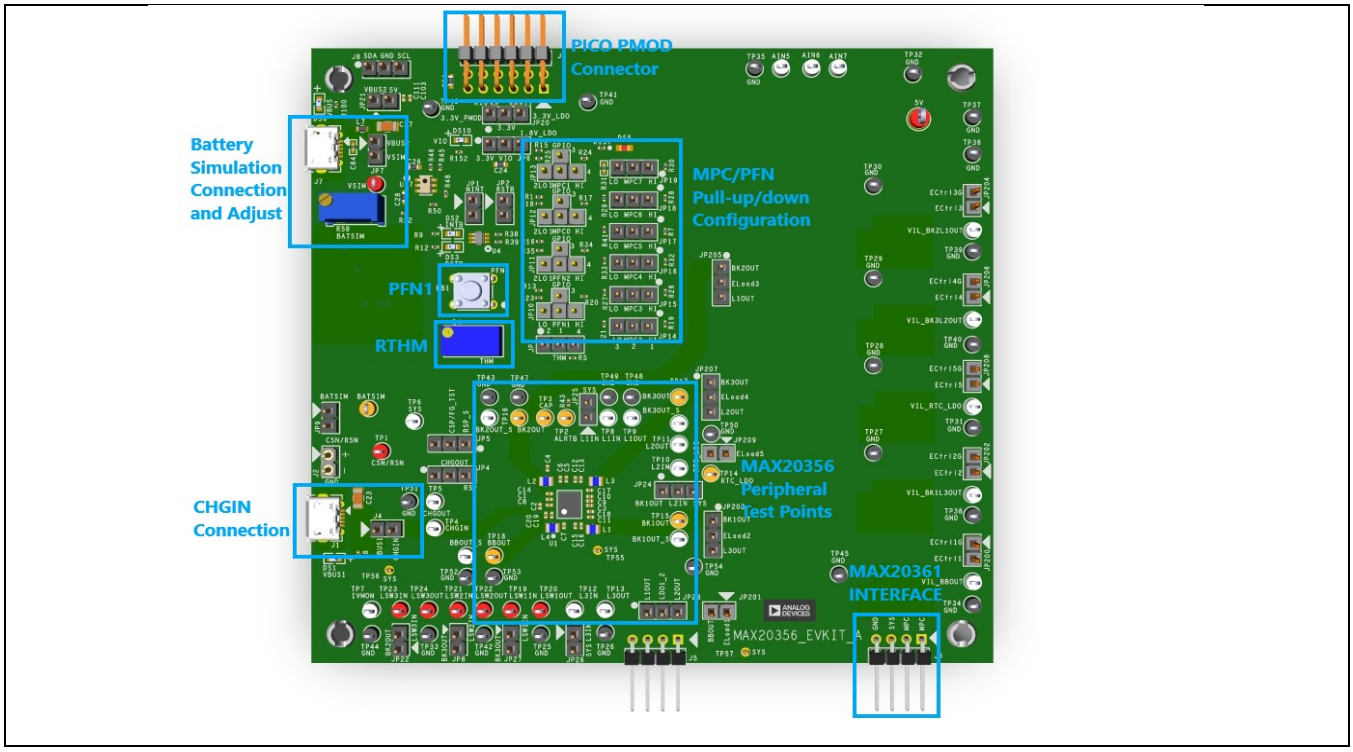


Figure 14. MAX20356 EV Kit Block Annotated Picture

PFNs and MPCs States

The PFNs and MPCs can be pulled up or pulled low to VIO through a 100kΩ resistor or connected to the ground through a 100kΩ resistor.

Regulators and Peripherals

All regulator outputs are made available on test points. The inputs to the LDOs and Load Switches can be supplied through setting the corresponding jumper for L_IN (JP25, JP24, and JP26) and LSW_IN (JP27, JP8, and JP22) or externally supplied through test points. The LDO1 input can be supplied from the V_{CCINT} of the IC if set through the I2C (bit LDO1IntSup). The bucks and buck-boost outputs have sense test points, which provide easy voltage measurement.

Thermistor setup

There are two configurations to set the desired thermistor voltage level. The thermistor pin has a 10kΩ internal pullup.

To position the thermistor in the room zone, set the DMM to measure Ω and connect the positive lead to pin1 of JP3. Turn the THM POT until the DMM reads ~10kΩ.

Remove the DMM and install a shunt in position 1-2 of JP3. The register map should report that the thermistor is in the room temperature zone.

There is also a 10kΩ fixed resistor by positioning the JP3 shunt to 2-3. This setting will put the thermistor in the room temperature zone.

$\overline{INT}$ and $\overline{RST}$ LED Indicators

Shunts can be installed on JP1 and JP2 to show the status of $\overline{INT}$ and $\overline{RST}$ as LED indicators, DS2 and DS3. When the corresponding LED illuminates, it verifies the active-low output is pulled low.

Jumper Setting

Table 1 shows the detailed jumper setting, and *Table 2* shows the connector description.

Table 1. Jumper Table

JUMPER	SHUNT POSITION	MAX20356 DESCRIPTION
JP1	1-2*	$\overline{INT}$ connect to pull up VIO and DS2
JP2	1-2*	$\overline{RST}$ connect to pull up VIO and DS3
JP3	1-2*	THM connect to potentiometer
	2-3	THM connect to 10kΩ
JP4	1-2*	Connects CHGOUT to CSN/RSN
	2-3	Connects CHGOUT to RSP
JP5	1-2	Connects CSP/FT_TST to RSP_S
	2-3*	Connects CSP/FT_TST to CSN/RSN
JP6	1-2*	Connects VIO to PMOD 3.3V
	1-3	Connects VIO to 1.8V_LDO
JP7	1-2*	Connects VBUS2 to VSIM
JP8	1-2	Connects BK3OUT to LSW2IN
JP9	1-2*	Connects BATSIM to CSN/RSN
JP10	1-2	PFN1 pull down to ground
	1-3	PFN1 connect to GPIO1
	1-4	PFN1 pull up to VIO
JP11	1-2	PFN2 pull down to ground
	1-3	PFN2 connect to GPIO1
	1-4	PFN2 pull up to VIO
JP12	1-2	MPC0 pull down to ground
	1-3	MPC0 connect to GPIO1
	1-4	MPC0 pull up to VIO
JP13	1-2	MPC1 pull down to ground
	1-3	MPC1 connect to GPIO1

	1-4	MPC1 pull up to VIO
JP14	1-2	MPC2 pull up to VIO
	2-3	MPC2 pull down to ground
JP15	1-2	MPC3 pull up to VIO
	2-3	MPC3 pull down to ground
JP16	1-2	MPC4 pull up to VIO
	2-3	MPC4 pull down to ground
JP17	1-2	MPC5 pull up to VIO
	2-3	MPC5 pull down to ground
JP18	1-2	MPC6 pull up to VIO
	2-3	MPC6 pull down to ground
JP19	1-2	MPC7 pull up to VIO
	2-3	MPC7 pull down to ground
JP20	1-2*	Selects 3.3V from 3.3V_PMOD
	2-3	Selects 3.3V from 3.3V_LDO
JP21	1-2	USB VBUS2 connects to 5V TP
JP22	1-2	Connects BK2OUT to LSW3IN
JP23	1-2	Connects LDO1_2 to L1OUT
	2-3	Connects LDO1_2 to L2OUT
JP24	1-2	Connects L2IN to BK1OUT
	2-3	Connects L2IN to SYS
JP25	1-2	Connects L1IN to SYS
JP26	1-2	Connects L3IN to SYS
JP27	1-2	Connects LSW1IN to BK3OUT
JP200	1-2	Reserved for future (RFU)
JP201	1-2	RFU
JP202	1-2	RFU
JP203	1-2	RFU
	2-3	RFU
JP204	1-2	RFU
JP205	1-2	RFU
	2-3	RFU
JP206	1-2	RFU
JP207	1-2	RFU
	2-3	RFU
JP208	1-2	RFU
JP209	1-2	RFU

**Default position.*

Table 2. Connector Description

CONNECTOR	DESCRIPTION	
J1	Connect to USB cable for CHGIN voltage	
J2	J2 Connect to battery	
J3	Connect to MAXPICO2PMB#	
J4	Connect to the VBUS1 to CHGIN. Install to use CHGIN	
J5	1	Connects to BBOUT
	2	Connects to LDO1_2 selector
	3	Connects to L3OUT
J6	1	Connects to MPC7
	2	Connects to MPC6
	3	Connects to SYS
J7		Connect to the USB cable for battery simulation and 5V connection
J8	1	Connects to SDA
	2	Connects to GND
	3	Connects to SCL

MAXPICO2PMB Firmware Update

This section covers the procedure to update the PICO2PMB Adapter Board with the latest firmware by programming a firmware image file **(.bin)** onto the on-board MAX32625PICO microcontroller.

Put the board in maintenance mode by holding the button while the board is connected to the computer. It may be easier to hold the button while inserting the USB cable at the computer end rather than the micro-USB connector end (see *Figure 15*).

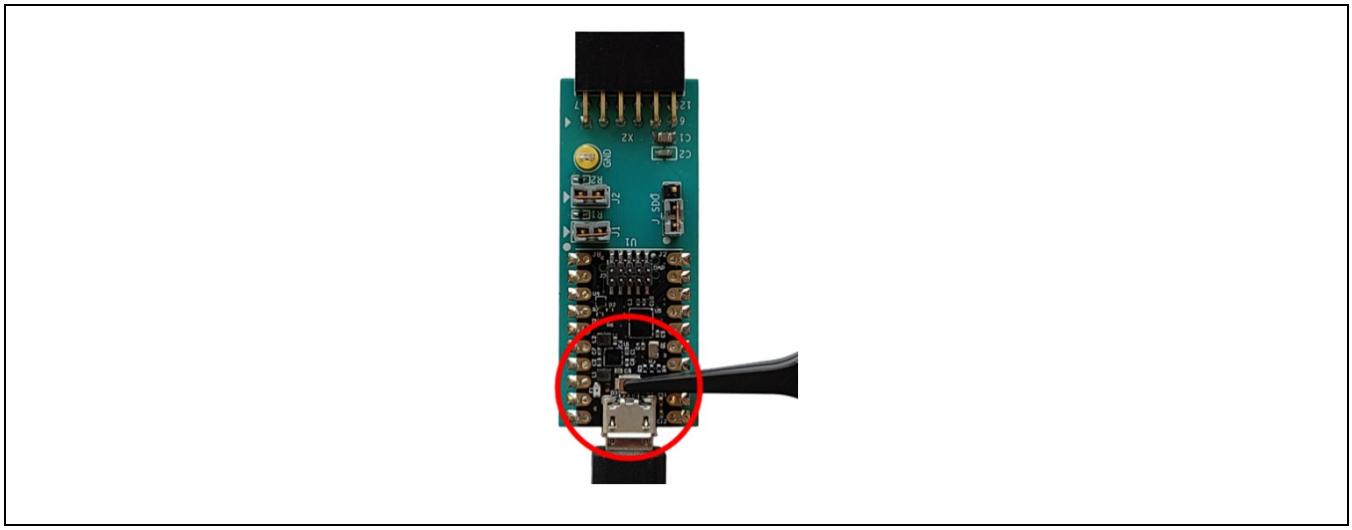


Figure 15. Enter Maintenance Mode on the MAX32625PICO.

If the board enters bootloader mode successfully, the LED on the board turns red, and the board appears to the computer as a USB drive named **MAINTENANCE**.

Drag and drop the firmware image file **(.bin)** into the **MAINTENANCE** drive, and the board installs the new firmware.

Ordering Information

PART	TYPE
MAX20356EVKIT#	EV Kit

#Denotes RoHS-compliance.

MAX20356 EV Kit Bill of Materials

ITEM	REF_DES	DNI/ DNP	QTY	MFG PART #	MANUFACTURER	VALUE	DESCRIPTION
1	5V	-	1	5010	KEYSTONE	N/A	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; RED; PHOSPHOR BRONZE WIRE SIL;
2	60, R74, R88, R144, R167	-	5	ERJ-2RKF4703	PANASONIC	470K	RES; SMT (0402); 470K; 1%; +/-100PPM/DEGC; 0.0630W
3	AIN5-AIN7, BBOUT_S, BK1OUT_S-BK3OUT_S, TP4-TP13, TP55-TP57, VIL_BBOUT, VIL_BK1L3OUT, VIL_BK2L1OUT, VIL_BK3L2OUT, VIL_RTC_LDO	-	25	5002	KEYSTONE	N/A	TEST POINT; PIN DIA=0.1IN; TOTAL LENGTH=0.3IN; BOARD HOLE=0.04IN; WHITE; PHOSPHOR BRONZE WIRE SILVER;
4	BATSIM, TP2, TP3, TP14-TP18	-	8	5003	KEYSTONE	N/A	TEST POINT; PIN DIA=0.1IN; TOTAL LENGTH=0.3IN; BOARD HOLE=0.04IN; ORANGE; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;
5	C1, C5, C9, C10, C12, C13, C15, C16	-	8	C1005X7S1A225K050BC	TDK	2.2UF	CAP; SMT (0402); 2.2UF; 10%; 10V; X7S; CERAMIC
6	C2	-	1	C1005X5R1V225K050BC	TDK	2.2UF	CAP; SMT (0402); 2.2UF; 10%; 35V; X5R; CERAMIC
7	C3	-	1	C1005X5R0J225K050BC; CL05A225KQ5NSN	TDK;SAMSUNG	2.2UF	CAP; SMT (0402); 2.2UF; 10%; 6.3V; X5R; CERAMIC
8	C4, C18	-	2	C1005X5R0J475K050BC	TDK	4.7UF	CAP; SMT (0402); 4.7UF; 10%; 6.3V; X5R; CERAMIC
9	C6-C8, C11, C14, C17, C19, C20	-	8	GRM158R61A226ME15	MURATA	22UF	CAP; SMT (0402); 22UF; 20%; 10V; X5R; CERAMIC ;
10	C21, C22, C32, C39, C40, C47, C48, C55, C56, C87, C88, C96, C104, C105, C109, C112, C113, C244	-	18	ANY	ANY	0.1UF	CAPACITOR; SMT (0402); CERAMIC CHIP; 0.1UF; 25V; TOL=10%; MODEL=C SERIES; TG=-55 DEGC TO +125 DEGC; TC=X7R; FORMFACTOR
11	C23, C27	-	2	GRM31CR71H475KA12;GRJ31CR71H	MURATA; MURATA; MURATA;	4.7UF	CAP; SMT (1206); 4.7UF; 10%; 50V; X7R; CERAMIC

				475KE11;GXM31CR71H475KA10;UMK316AB7475KL;GRM31CR71H475KA12L;CC1206KKX7R9BB475;CC1206KKX7R9BB475	TAIYO YUDEN;MURATA;YAGEO		
12	C24	-	1	C1608X5R1H104K080AA	TDK	0.1UF	CAP; SMT (0603); 0.1UF; 10%; 50V; X5R; CERAMIC
13	C25, C106, C107	-	3	ANY	ANY	1UF	CAPACITOR; SMT (0402); CERAMIC CHIP; 1UF; 16V; TOL=10%; MODEL=C SERIES; TG=-55 DEGC TO +85 DEGC; TC=X5R; FORMFACTOR
14	C26	-	1	C0603C225K9PAC;GRM188R60J225KE01;C1608X5R0J225K080AB	KEMET;MURATA;TDK	2.2UF	CAP; SMT (0603); 2.2UF; 10%; 6.3V; X5R; CERAMIC;
15	C28	-	1	C0603C475K9PAC	KEMET	4.7UF	CAP; SMT (0603); 4.7UF; 10%; 6.3V; X5R; CERAMIC;
16	C29	-	1	C0402X7R500-222KNE;GRM155R71H222KA01;C1005X7R1H222K050BA	VENKEL LTD.;MURATA;TDK	2200PF	CAP; SMT (0402); 2200PF; 10%; 50V; X7R; CERAMIC
17	C30	-	1	C0603C104K8RAC	KEMET	0.1UF	CAP; SMT (0603); 0.1UF; 10%; 10V; X7R; CERAMIC
18	C31	-	1	C3216X5R1C476M160AB;GRM31CR61C476ME44	TDK;MURATA	47UF	CAP; SMT (1206); 47UF; 20%; 16V; X5R; CERAMIC
19	C33, C41, C49, C57, C89	-	5	ANY	ANY	0.01UF	CAPACITOR; SMT (0402); CERAMIC CHIP; 0.01UF; 10V; TOL=10%; MODEL=C0402C SERIES; TG=-55 DEGC TO +125 DEGC; TC=X7R
20	C34	-	1	GRM188R60J105KA01	MURATA	1UF	CAP; SMT (0603); 1UF; 10%; 6.3V; X5R; CERAMIC;
21	C35, C42, C43, C50, C51, C58, C59, C90, C91, C102	-	10	GRM155R71H102JA01;GCM155R71H102JA37	MURATA;MURATA	1000PF	CAP; SMT (0402); 1000PF; 5%; 50V; X7R; CERAMIC
22	C36, C44, C52, C60, C92	-	5	ANY	ANY	1UF	CAPACITOR; SMT (0402); CERAMIC CHIP; 1UF; 6.3V; TOL=20%; MODEL=C SERIES; TG=-55 DEGC TO +85 DEGC; TC=X5R ; FORMFACTOR
23	C37, C38, C45, C46, C53, C54,	-	13	C0402C472J5RAC	KEMET	4700PF	CAP; SMT (0402); 4700PF; 5%; 50V; X7R; CERAMIC

	C61-C63, C86, C93, C110, C238						
24	C64, C103	-	2	C1005X5R1A475K050	TDK	4.7UF	CAP; SMT (0402); 4.7UF; 10%; 10V; X5R; CERAMIC
25	C94, C95	-	2	GRM155R61C104KA88	MURATA	0.1UF	CAP; SMT (0402); 0.1UF; 10%; 16V; X5R; CERAMIC
26	C97-C100	-	4	C0402C105K8PAC;CC0402KRX5R6BB105	KEMET;YAGEO	1UF	CAP; SMT (0402); 1UF; 10%; 10V; X5R; CERAMIC
27	C101, C111	-	2	GRM155R71A104JA01	MURATA	0.1UF	CAP; SMT (0402); 0.1UF; 5%; 10V; X7R; CERAMIC
28	C108	-	1	C3216X5R1H106K160AB;GRM31CR61H106KA12	TDK;MURATA	10UF	CAP; SMT (1206); 10UF; 10%; 50V; X5R; CERAMIC
29	DS1-DS3, DS6, DS10	-	5	LG L29K-G2J1-24	OSRAM	LG L29K-G2J1-24	DIODE; LED; SMT (0603); Vf=1.7V; If(test)=0.002A; -40 DEGC TO +100 DEGC
30	DS5	-	1	LTST-C190CKT	LITE-ON ELECTRONICS INC.	LTST-C190CKT	DIODE; LED; STANDARD; RED; SMT (0603); PIV=5.0V; IF=0.04A; -55 DEGC TO +85 DEGC
31	J1, J7	-	2	ZX62D-B-5P8	HIROSE ELECTRIC CO LTD.	ZX62D-B-5P8	CONNECTOR; MALE; SMT; MICRO UNIVERSAL SERIES BUS B-TYPE CONNECTOR; RIGHT ANGLE; 5PINS
32	J2	-	1	800-10-002-10-001000	MILLMAX	800-10-002-10-001000	CONNECTOR; MALE; TH; SINGLE ROW; STRAIGHT; 2PINS
33	J3	-	1	PBC06DBAN	SULLINS ELECTRONICS CORP.	PBC06DBAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; RIGHT ANGLE; 12PINS; 12PINS - ALTERNATE PIN NUMBERING
34	J4, JP1, JP2, JP7-JP9, JP21, JP22, JP25-JP27	-	11	PBC02SAAN	SULLINS ELECTRONICS CORP.	PBC02SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 2PINS
35	J5, J6	-	2	PEC04SBAN	SULLINS ELECTRONICS CORP.	PEC04SBAN	CONNECTOR; MALE; THROUGH HOLE; 0.100INCH CONTACT CENTERS; MALE BREAKAWAY HEADERS; RIGHT ANGLE; NO MOUNTING; 4PINS
36	J8, JP3-JP6, JP14-JP20, JP23, JP24, JP203, JP205, JP207	-	17	PBC03SAAN	SULLINS	PBC03SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 3PINS; -65 DEGC TO +125 DEGC
37	JP10-JP13	-	4	TSW-104-07-L-S	SAMTEC	TSW-104-07-L-S	EVKIT PART-CONNECTOR; MALE; THROUGH HOLE; TSW SERIES; SINGLE ROW; STRAIGHT; 4PINS

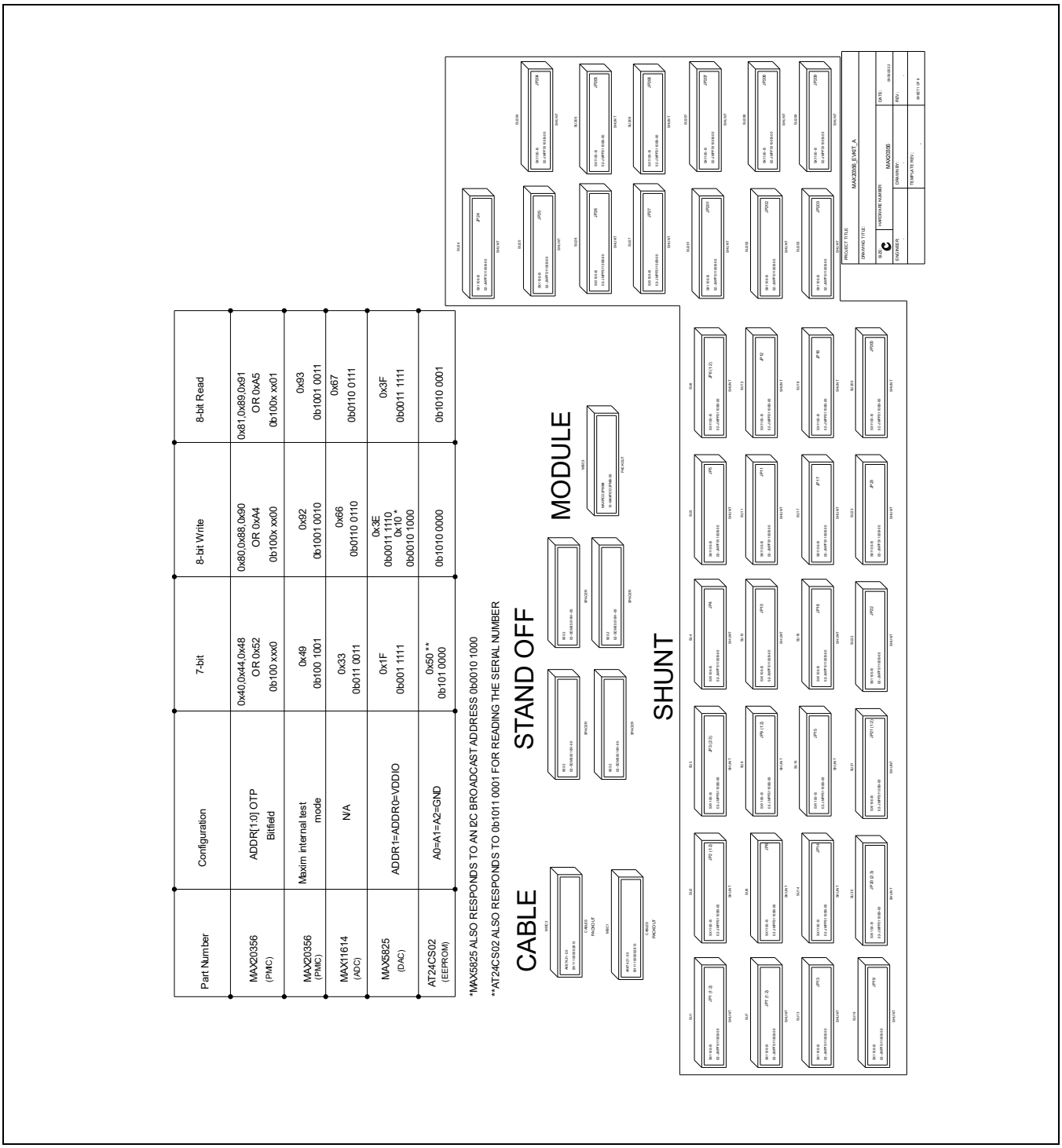
38	JP200-JP202, JP204, JP206, JP208, JP209	-	7	TSW-102-07-T-S	SAMTEC	TSW-102-07-T-S	CONNECTOR; THROUGH HOLE; TSW SERIES; SINGLE ROW; STRAIGHT; 2PINS; -55 DEGC TO +105 DEGC
39	L1-L4	-	4	DFE201612E-2R2M	MURATA	2.2UH	INDUCTOR; SMT (0806); WIREWOUND CHIP; 2.2UH; TOL=+/-20%; 1.8A
40	L7	-	1	BLM18AG601SN1	MURATA	600	INDUCTOR; SMT (0603); FERRITE-BEAD; 600; TOL=+/-; 0.5A
41	PB1	-	1	1825910-6	TE CONNECTIVITY	1825910-6	SWITCH; SPST; THROUGH HOLE; 24V; 0.05A; TACTILE SWITCH; RCOIL=0 OHM; RINSULATION=100M OHM; TE CONNECTIVITY
42	Q200-Q204	-	5	IPC100N04S5L1R1ATMA1	INFINEON	IPC100N04S5L1R1ATMA1	TRAN; OPTIMOS 5 POWER-TRANSISTOR; NCH; PG-TDSON-8-34; PD-(150W); I-(100A); V-(40V)
43	Q208	-	1	FDN360P	ON SEMICONDUCTOR	FDN360P	TRANSISTOR, MOSFET P-CHANNEL, SUPERSOT-3, PD=0.5W, ID=-2.0A, VDSS=-30V,VGSS=+/-20V
44	Q209	-	1	2N7002;2N7002;2N7002;2N7002	DIODES INCORPORATED;ST MICROELECTRONICS;ON SEMICONDUCTOR;MICRO COMMERCIAL COMPONENTS	2N7002	TRAN; ; NCH; SOT-23; PD-(0.33W); IC-(0.5A); VCEO-(60V); -55 DEGC TO +150 DEGC
45	R1, R13, R15, R16	-	4	ERJ-2RKF1001	PANASONIC	1K	RES; SMT (0402); 1K; 1%; +/-100PPM/DEGC; 0.1000W
46	R3, R22, R55, R69, R83, R139	-	6	9C04021A1000FL; RC0402FR-07100RL	PANASONIC;YAGEO PHYCOMP	100	RES; SMT (0402); 100; 1%; +/-100PPM/DEGC; 0.0630W
47	R4	-	1	PV36Y105C01B00	MURATA	1M	RESISTOR; THROUGH-HOLE-RADIAL LEAD; PV36 SERIES; 1M OHM; 10%; 100PPM; 0.5W; TRIMMER POTENTIOMETER; 25 TURNS; MOLDER CERAMIC OVER METAL FILM
48	R5, R10, R11, R38, R39, R49, R53, R96-R99, R174, R175, R281, R282	-	15	RC0402FR-0710KL;CR0402-FX-1002GLF	YAGEO;BOURNS	10K	RES; SMT (0402); 10K; 1%; +/-100PPM/DEGC; 0.0630W

49	R6	-	1	ERJ-2LWFR010	PANASONIC	0.01	RES; SMT (0402); 0.01; 1%; 0 TO +500PPM/DEGC; 0.2000W
50	R7, R17-R21, R23-R35, R41, R45, R46, R48, R50, R57	-	25	ERJ-2GEJ104	PANASONIC	100K	RES; SMT (0402); 100K; 5%; +/-200PPM/DEGC; 0.1000W
51	R8, R9, R12, R100, R152	-	5	CRCW0402499RFK	VISHAY DALE	499	RES; SMT (0402); 499; 1%; +/-100PPM/DEGC; 0.0630W
52	R14, R40, R68, R82, R138	-	5	CRCW040220K0FK	VISHAY DALE	20K	RES; SMT (0402); 20K; 1%; +/-100PPM/DEGC; 0.0630W
53	R36, R42, R70, R84, R140, R161, R178-R180, R286	-	10	ANY	ANY	0	RESISTOR; 0402; 0 OHM; 1%; 100PPM; 0.0625W; THICK FILM; FORMFACTOR
54	R43	-	1	CRCW04024K70FK;MCR01MZPF4701	VISHAY DALE;ROHM SEMICONDUCTOR	4.7K	RES; SMT (0402); 4.7K; 1%; +/-100PPM/DEGC; 0.0630W
55	R44, R72, R73, R86, R87, R142, R143, R164-R166	-	10	ERJ-2RKF2002	PANASONIC	20K	RES; SMT (0402); 20K; 1%; +/-100PPM/DEGC; 0.1000W
56	R47, R61, R81, R89, R145	-	5	CRCW0402649KFK	VISHAY DALE	649K	RES; SMT (0402); 649K; 1%; +/-100PPM/DEGC; 0.0630W
57	R51, R60, R158-R160	-	5	ERJ-2GE0R00	PANASONIC	0	RES; SMT (0402); 0; JUMPER; JUMPER; 0.1000W
58	R52	-	1	ERJ-2RKF5100	PANASONIC	510	RES; SMT (0402); 510; 1%; +/-100PPM/DEGC; 0.1000W
59	R54, R56	-	2	WSL0805R1000FEA18	VISHAY DALE	0.1	RES; SMT (0805); 0.1; 1%; +/-75PPM/DEGC; 0.1250W
60	R58	-	1	3296Y-1-253LF	BOURNS	25K	RESISTOR; THROUGH-HOLE-RADIAL LEAD; 3296 SERIES; 25K OHM; 10%; 100PPM; 0.5W; SQUARE TRIMMING POTENTIOMETER; 25 TURNS; MOLDER CERAMIC OVER METAL FILM
61	R59	-	1	ERJ-2RKF1152	PANASONIC	11.5K	RES; SMT (0402); 11.5K; 1%; +/-100PPM/DEGC; 0.1000W
62	R62, R75, R90, R148, R170	-	5	CRCW04021M00FK	VISHAY DALE	1M	RES; SMT (0402); 1M; 1%; +/-100PPM/DEGC; 0.0630W
63	R63, R64, R76, R77, R91, R92, R146, R147, R168, R169	-	10	ANY	ANY	1K	RESISTOR; 0402; 1K; 1%; 100PPM; 0.0625W; THICK FILM; FORMFACTOR
64	R65, R67, R78, R80,	-	10	CRCW0402787KFK	VISHAY DALE	787K	RES; SMT (0402); 787K; 1%; +/-100PPM/DEGC; 0.0630W

	R93, R95, R149, R151, R172, R173						
65	R66, R79, R94, R171	-	4	CRL1206-JW-R100ELF	BOURNS	0.1	RES; SMT (1206); 0.1; 1%; +/-200PPM/DEGC; 0.2500W
66	R71, R85, R141, R162, R163	-	5	RC0402FR-07680RL	YAGEO	680	RES; SMT (0402); 680; 1%; +/-100PPM/DEGC; 0.0630W
67	R150	-	1	CRCW1206178RFK	VISHAY DALE	178	RES; SMT (1206); 178; 1%; +/-100PPM/DEGC; 0.2500W
68	R153	-	1	CRCW04024752FK; 9C04021A4752FLHF3; CRCW040247K5FK	VISHAY DALE;YAGEO;VISHAY DALE	47.5K	RES; SMT (0402); 47.5K; 1%; +/-100PPM/DEGC; 0.0630W
69	R2, R37, R154, R156	-	4	CRCW040210 0KFK;RC0402FR-07100KL	VISHAY; YAGEO	100K	RES; SMT (0402); 100K; 1%; +/-100PPM/DEGC; 0.0630W
70	R155	-	1	CRCW040216 9KFK	VISHAY DALE	169K	RES; SMT (0402); 169K; 1%; +/-100PPM/DEGK; 0.0630W
71	R157	-	1	CRCW040247 0RFK	VISHAY DALE	470	RES; SMT (0402); 470; 1%; +/-100PPM/DEGC; 0.0630W
72	R176, R177	-	2	ANY	ANY	0	RESISTOR; 0603; 0 OHM; 0%; JUMPER; 0.10W; THICK FILM; FORMFACTOR
73	SPACER1-SPACER4	-	4	9032	KEYSTONE	9032	MACHINE FABRICATED; ROUND-THRU HOLE SPACER; NO THREAD; M3.5; 5/8IN; NYLON
74	SU1-SU27, SU200-SU209	-	37	S1100-B;SX1100-B;STC02SYAN	KYCON;KYCON;SULLINS ELECTRONICS CORP.	SX1100-B	TEST POINT; JUMPER; STR; TOTAL LENGTH=0.24IN; BLACK; INSULATION=PBT;PHOSPHOR BRONZE CONTACT=GOLD PLATED
75	TP1, TP19-TP24, VSIM	-	8	5000	KEYSTONE	N/A	TEST POINT; PIN DIA=0.1IN; TOTAL LENGTH=0.3IN; BOARD HOLE=0.04IN; RED; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;
76	TP25-TP54	-	30	5001	KEYSTONE	N/A	TEST POINT; PIN DIA=0.1IN; TOTAL LENGTH=0.3IN; BOARD HOLE=0.04IN; BLACK; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;
77	U1	-	1	MAX20356	MAXIM	MAX20356	EVKIT PART- IC; WEARABLE POWER NAMAGEMENT SOLUTION; PACKAGE OUTLINE DRAWING: 21-100616; WLP 63 PINS; 0.5MM PITCH; PACKAGE CODE: W633A4+1
78	U2	-	1	OPA569AIDWPR	TEXAS INSTRUMENTS	OPA569AIDWPR	IC; AMP; RAIL-TO-RAIL I/O; POWER AMPLIFIER; WSOIC20-EP 300MIL
79	U3	-	1	MAX5825AWP+	MAXIM	MAX5825AWP+T	IC; DAC; ULTRA-SMALL; OCTAL CHANNEL; 12-BIT BUFFERED OUTPUT DAC WITH INTERNAL REFERENCE AND I2C INTERFACE; WLP20

80	U4	-	1	NC7WZ07P6X	FAIRCHILD SEMICONDUCTOR	NC7WZ07P6X	IC; BUF; TINY LOGIC ULTRA-HIGH SPEED DUAL BUFFER; SC70-6
81	U5	-	1	MAX1697UEUT+	MAXIM	MAX1697UEUT+	IC; INV; INVERTING CHARGE PUMP WITH SHUTDOWN; SOT23-6
82	U6, U8, U10, U12, U20	-	5	MAX44251AUA+	MAXIM	MAX44251AUA+	IC; OPAMP; ULTRA-PRECISION; LOW-NOISE OP AMP; UMAX8;
83	U22	-	1	MAX6071AAUT41+	MAXIM	MAX6071AAUT41+	IC; VREF; LOW NOISE; HIGH-PRECISION SERIES VOLTAGE REFERENCE; SOT23-6
84	U23	-	1	MAX11614EEE+	MAXIM	MAX11614EEE+	IC; ADC; LOW-POWER; 8-CHANNEL; I2C; 12-BIT ADC IN ULTRA-SMALL PACKAGE; QSOP16
85	U24, U25	-	2	MAX8512EXK+	MAXIM	MAX8512EXK	IC, VREG, Ultra-Low-Noise, High PSRR, Adjustable Vout, SC70-5
86	U26	-	1	AT24CS02-SSHM	MICROCHIP	AT24CS02-SSHM	IC; EPROM; I2C-COMPATIBLE TWO-WIRE SERIAL EEPROM; 150MIL; NSOIC8
87	U27	-	1	MAX8880EUT+	MAXIM	MAX8880EUT+	IC; VREG; ULTRA-LOW-IQ LOW-DROPOUT LINEAR REGULATOR WITH POK; SOT23-6
88	PCB	-	1	MAX20356	MAXIM	PCB	PCB:MAX20356
89	MISC1, MISC2	DNI	2	AK67421-0.5	ASSMANN	AK67421-0.5	CONNECTOR; USB CABLE; MALE-MALE; USB_2.0; 5PINS-4PINS; 500MM
90	MISC3	DNI	1	MAXPICO2PMB#	MAXIM	MAXPICO2PMB#	ACCESSORY; BRD; PACKOUT; MAXPICO2PMB ADAPTER BOARD
TOTAL			438				

MAX20356 EV Kit Schematics

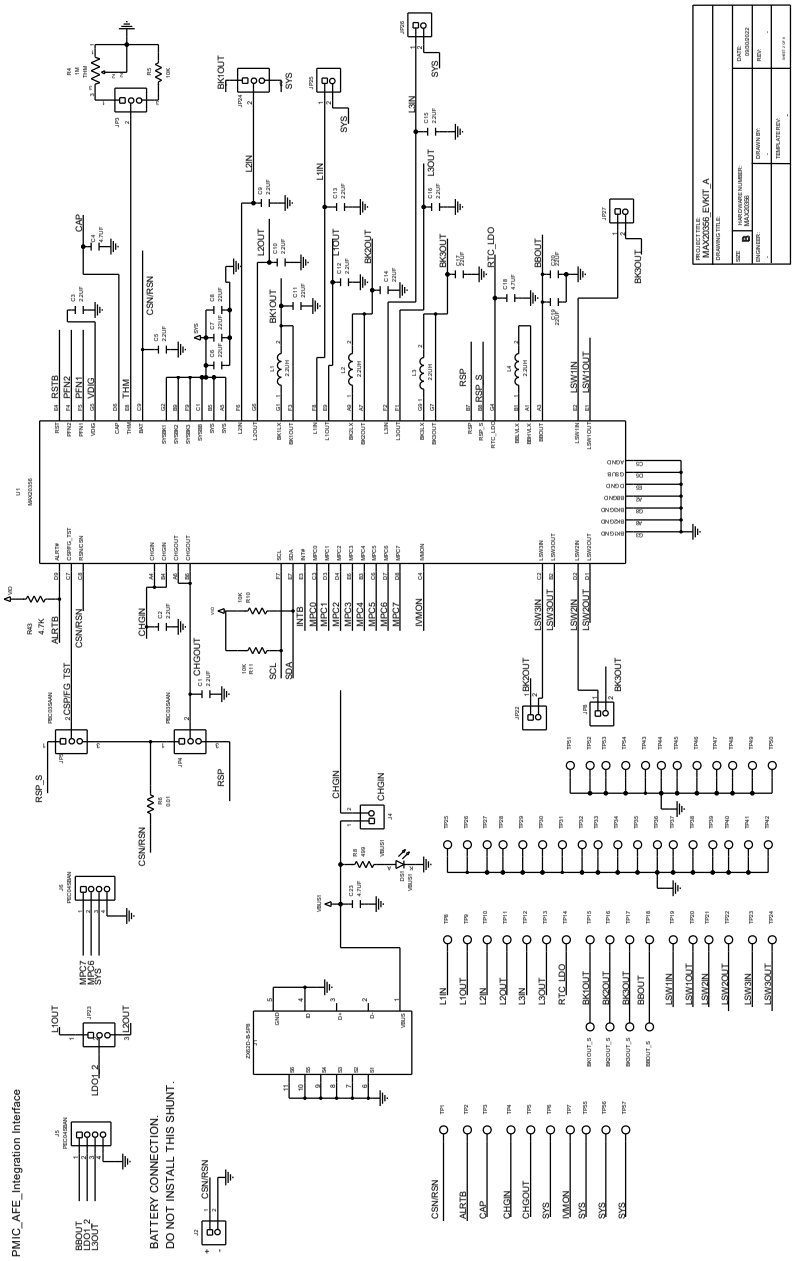


Part Number	Configuration	7-bit	8-bit Write	8-bit Read
MAX20356 (PMC)	ADDR[1:0] OTP Bitfield	0x40,0x44,0x48 OR 0x52 0b100 xxx0	0x80,0x88,0x90 OR 0xA4 0b100x xx00	0x81,0x89,0x91 OR 0xA5 0b100x xx01
MAX20356 (PMC)	Maxim internal test mode	0x49 0b100 1001	0x92 0b1001 0010	0x93 0b1001 0011
MAX11614 (ADC)	N/A	0x33 0b011 0011	0x66 0b0110 0110	0x67 0b0110 0111
MAX5825 (DAC)	ADDR1=ADDR0=VDDIO	0x1F 0b001 1111	0x3E 0b0011 1110 0x10* 0b0010 1000	0x3F 0b0011 1111
AT24CS02 (EEPROM)	A0=A1=A2=GND	0x50 ** 0b101 0000	0b1010 0000	0b1010 0001

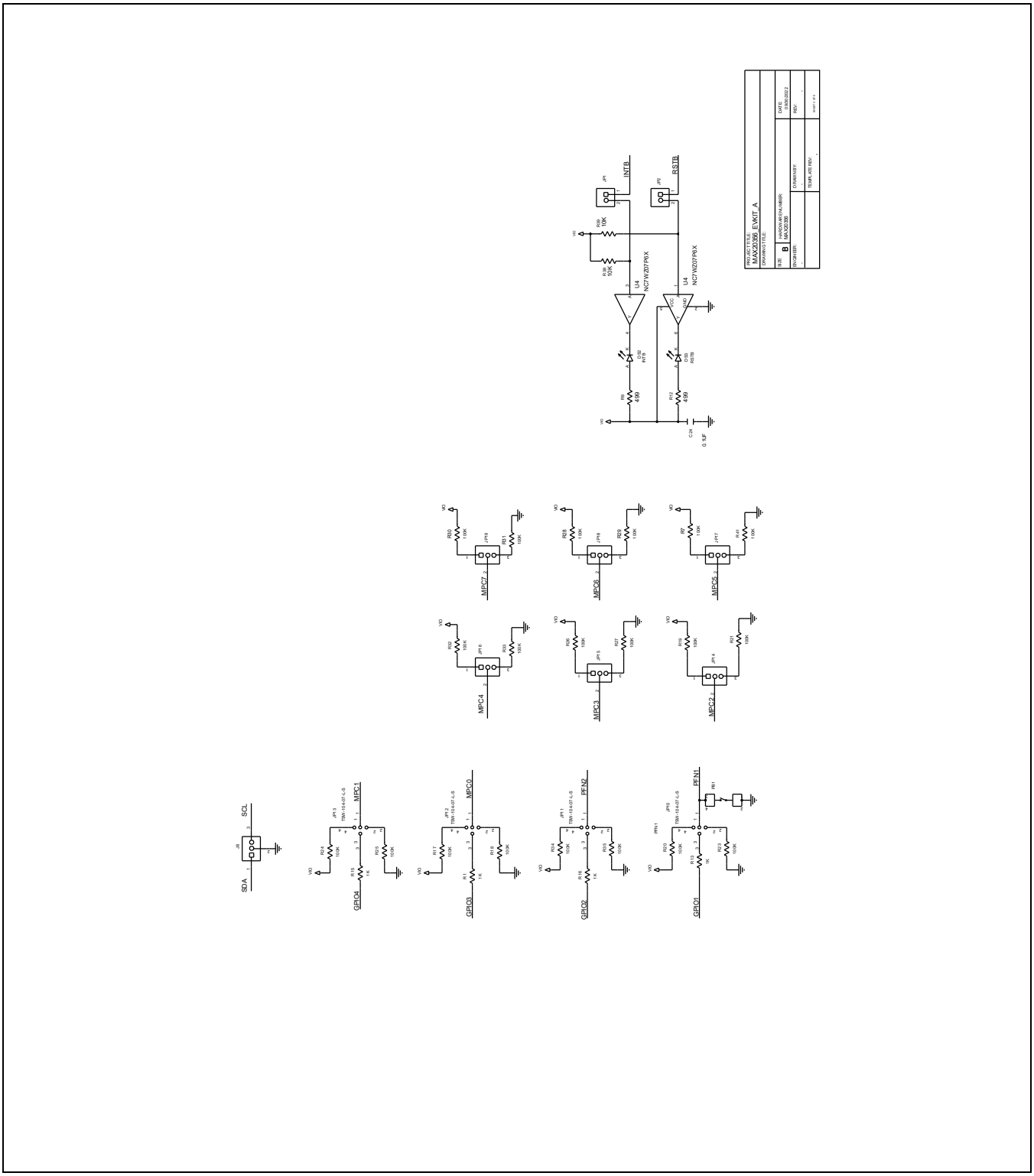
*MAX5825 ALSO RESPONDS TO AN I2C BROADCAST ADDRESS 0b0010 1000

**AT24CS02 ALSO RESPONDS TO 0b1011 0001 FOR READING THE SERIAL NUMBER

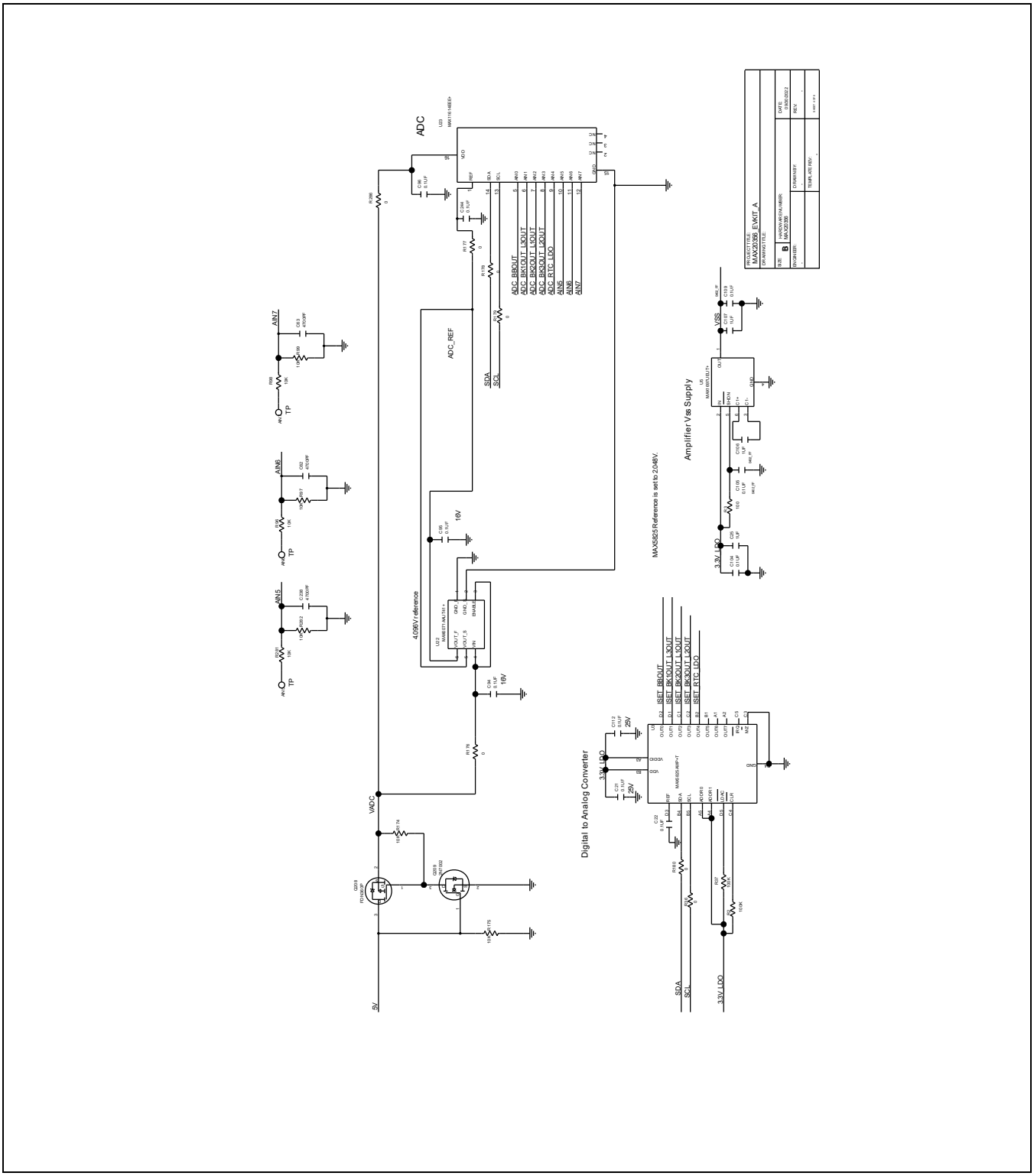
MAX20356 EV Kit Schematics (continued)



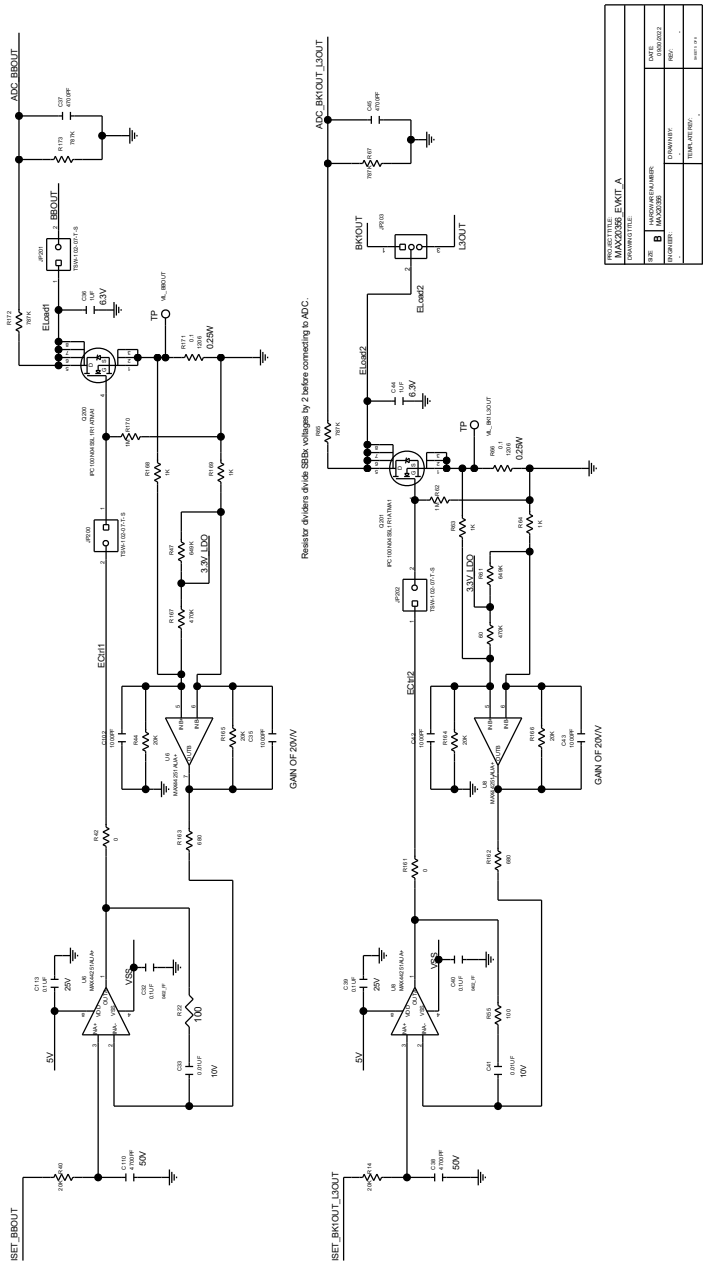
MAX20356 EV Kit Schematics (continued)



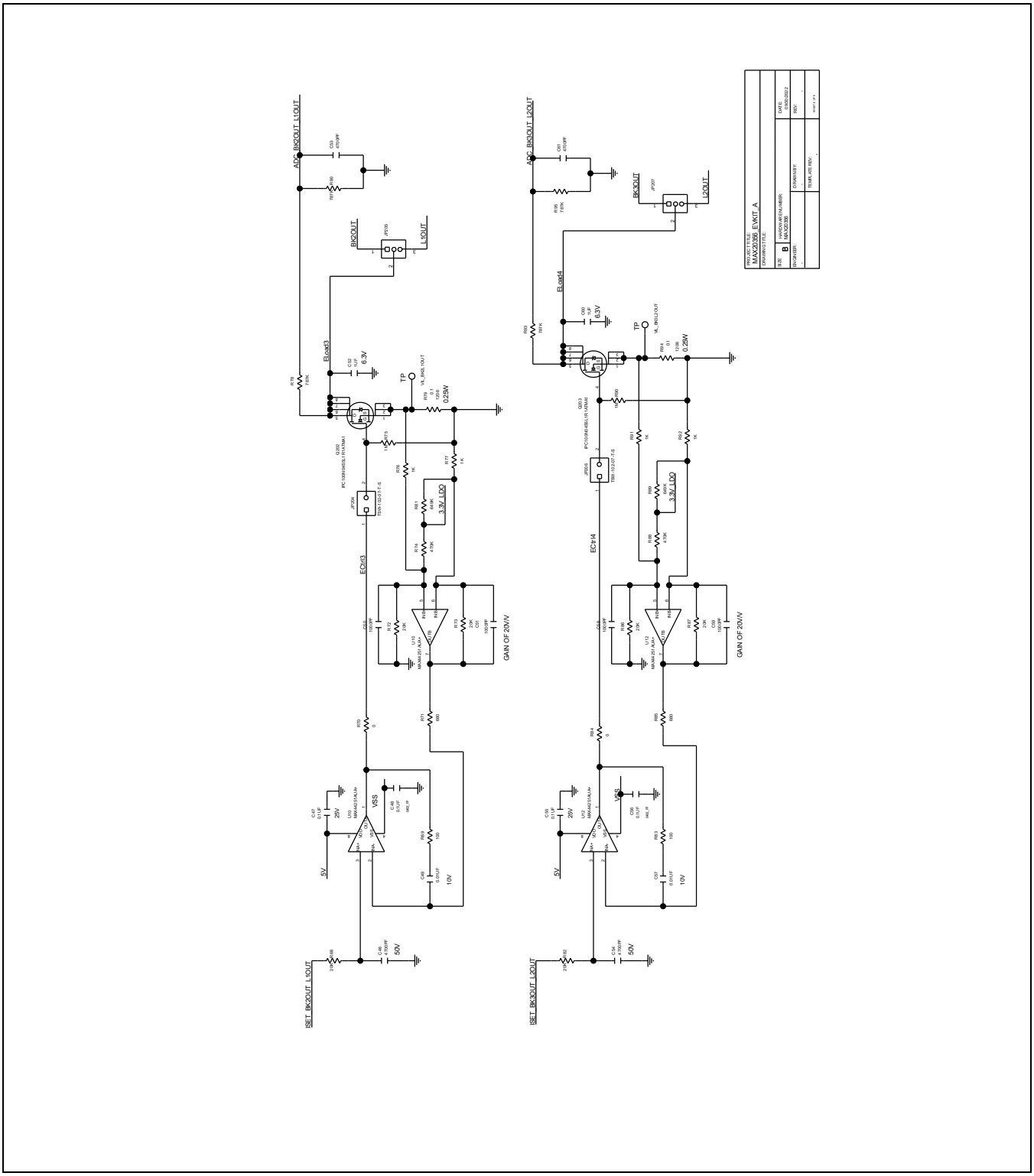
MAX20356 EV Kit Schematics (continued)



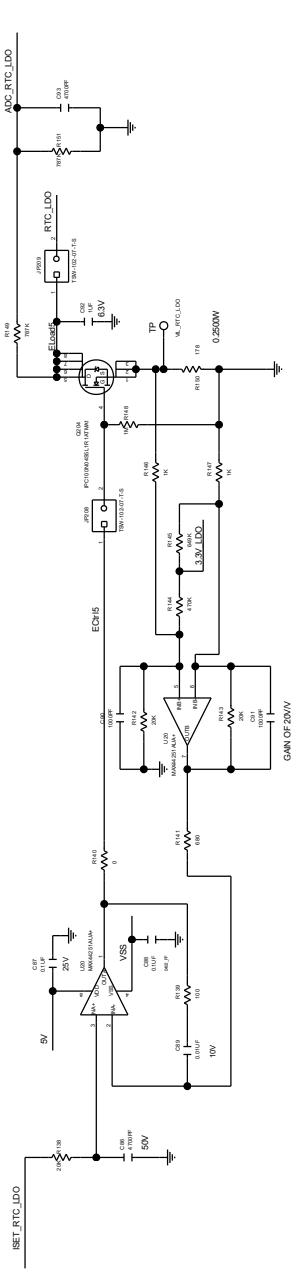
MAX20356 EV Kit Schematics (continued)



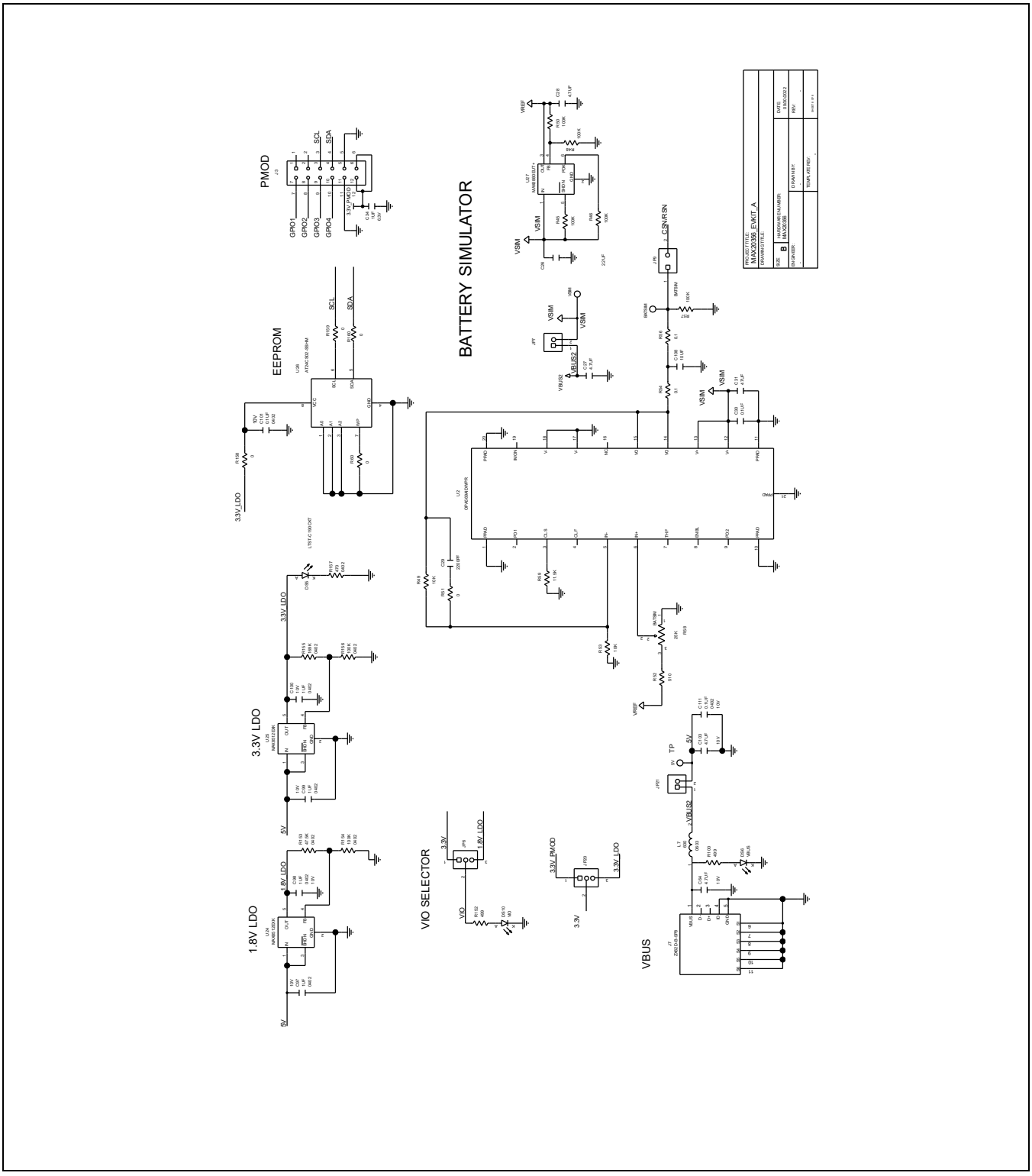
MAX20356 EV Kit Schematics (continued)



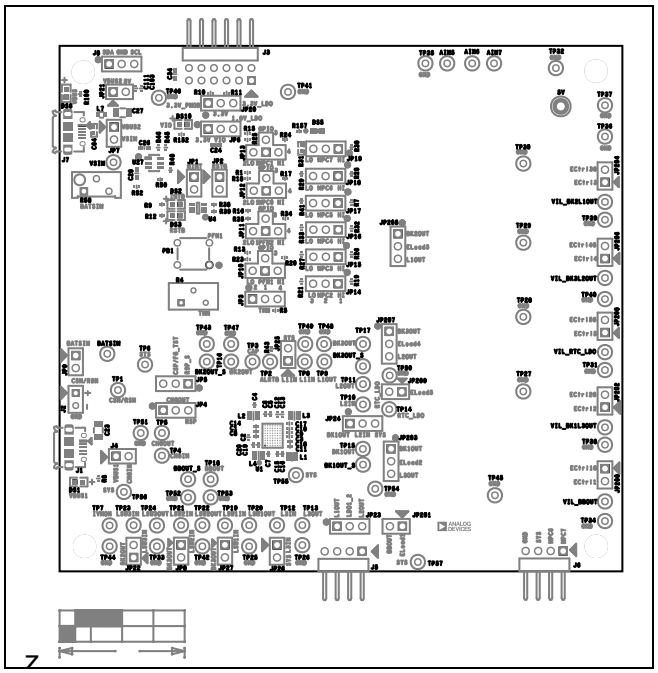
MAX20356 EV Kit Schematics (continued)



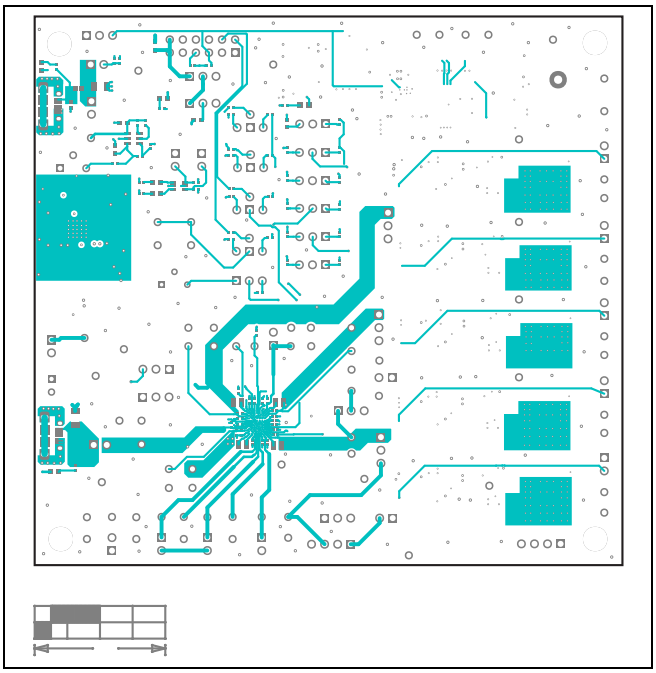
MAX20356 EV Kit Schematics (continued)



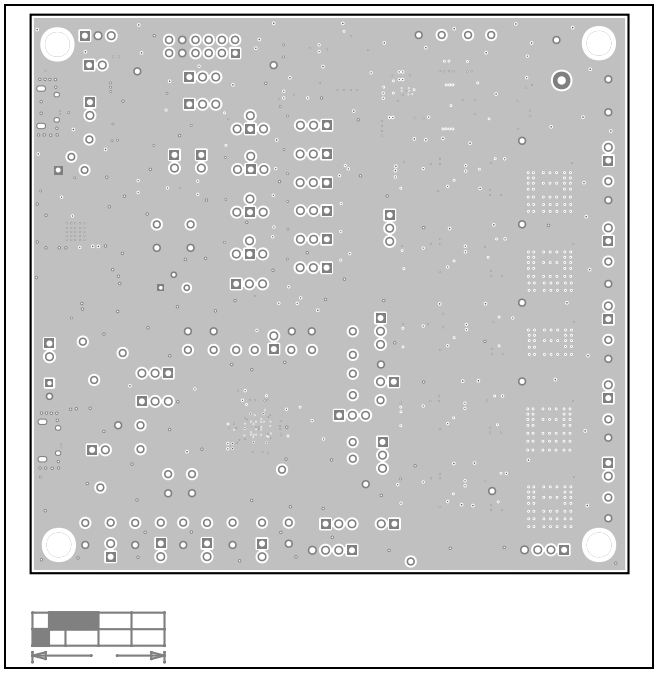
MAX20356 EV Kit PCB Layouts



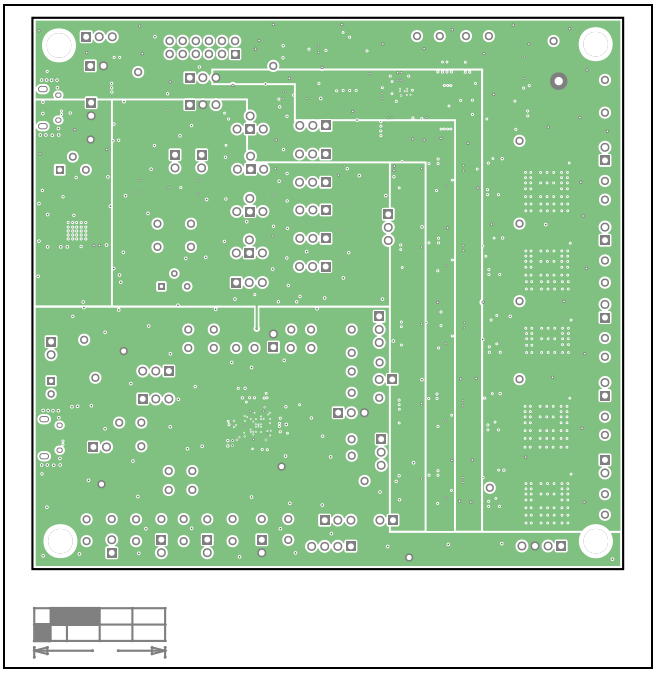
MAX20356 EV Kit Component Placement Guide—Top Silkscreen



MAX20356 EV Kit PCB Layout—Top

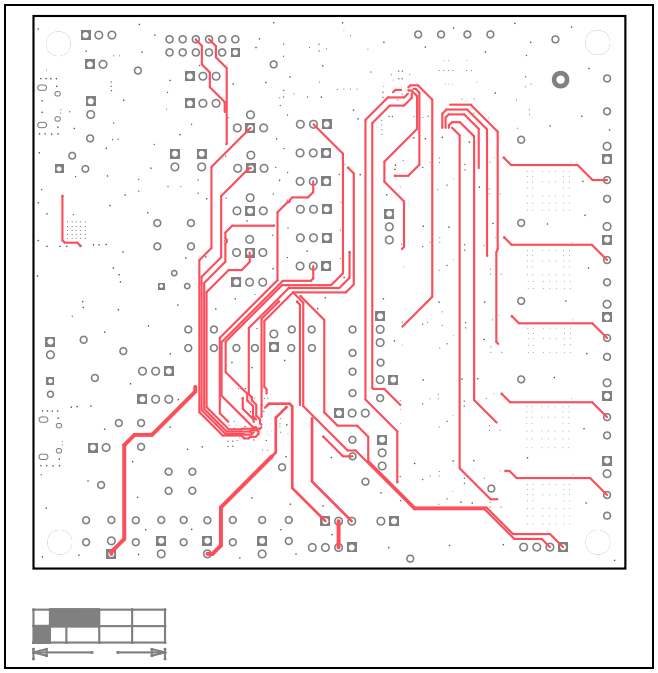


MAX20356 EV Kit PCB Layout—GND1

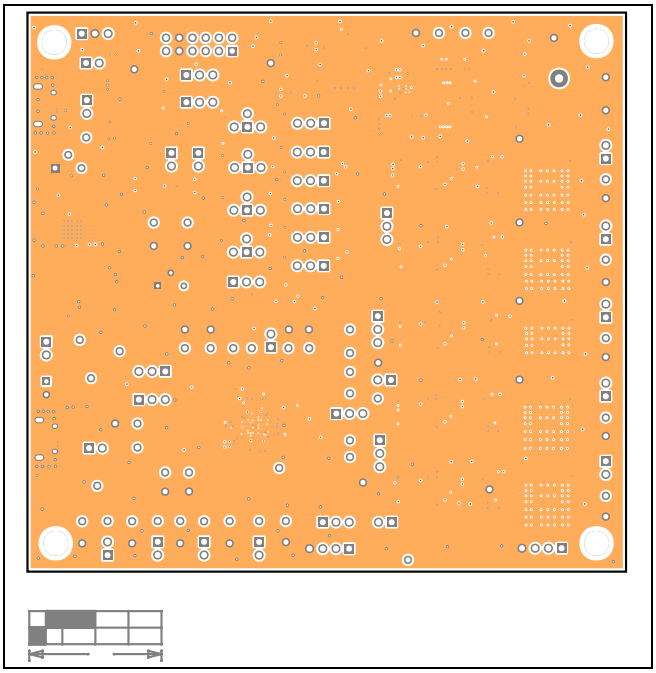


MAX20356 EV Kit PCB Layout—Power

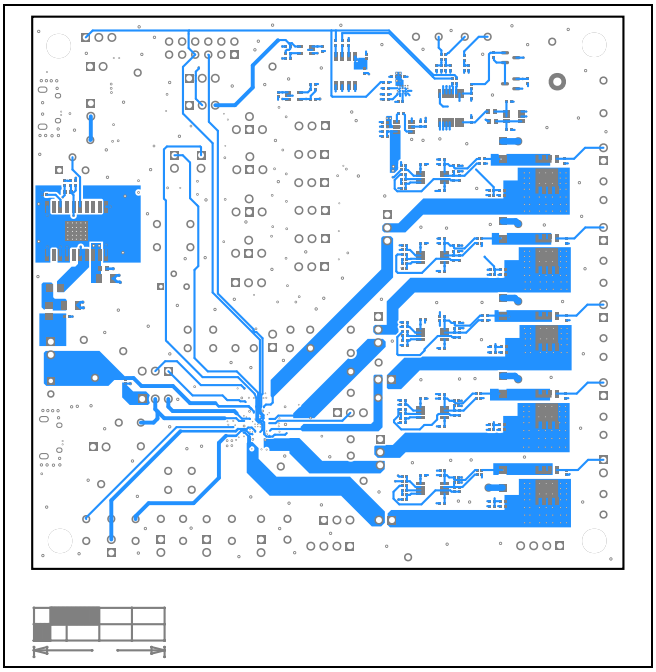
MAX20356 EV Kit PCB Layouts (continued)



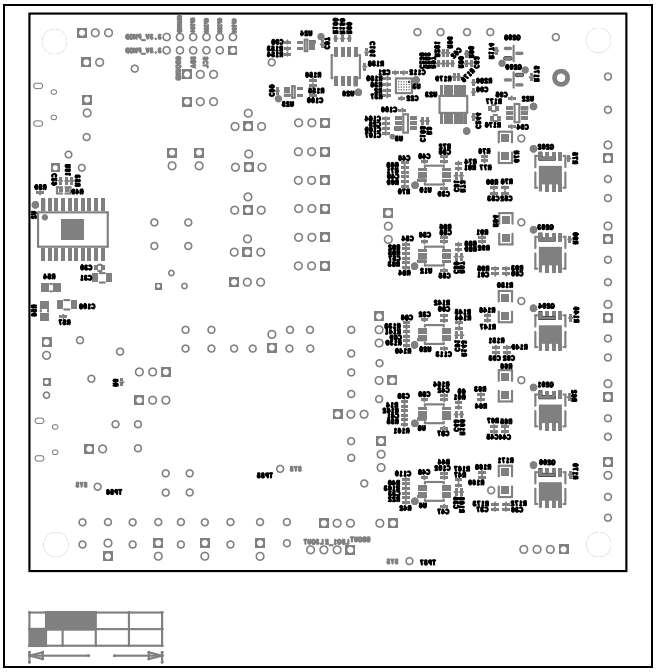
MAX20356 EV Kit PCB Layout—Signal



MAX20356 EV Kit PCB Layout—GND2



MAX20356 EV Kit PCB Layout—Bottom



MAX20356 EV Kit Component Placement Guide—Bottom Silkscreen

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	1/23	Initial release	—

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