

MAX28200 Evaluation Kit

Evaluates: MAX28200

General Description

The MAX28200 evaluation kit (EV kit) provides a development platform that provides access to all the features of the MAX28200 in a tiny, easy to use board. The ROM-based bootloader is accessed through JTAG or an I²C interface. Connectors are provided for a host bus adapter, the DS9481P programming tool, and for JTAG. Board power can be supplied by USB, host bus adapter, JTAG, or the DS9481P programming tool. This board provides a powerful processing subsystem in a very small space that can be easily integrated into a variety of applications.

EV Kit Contents

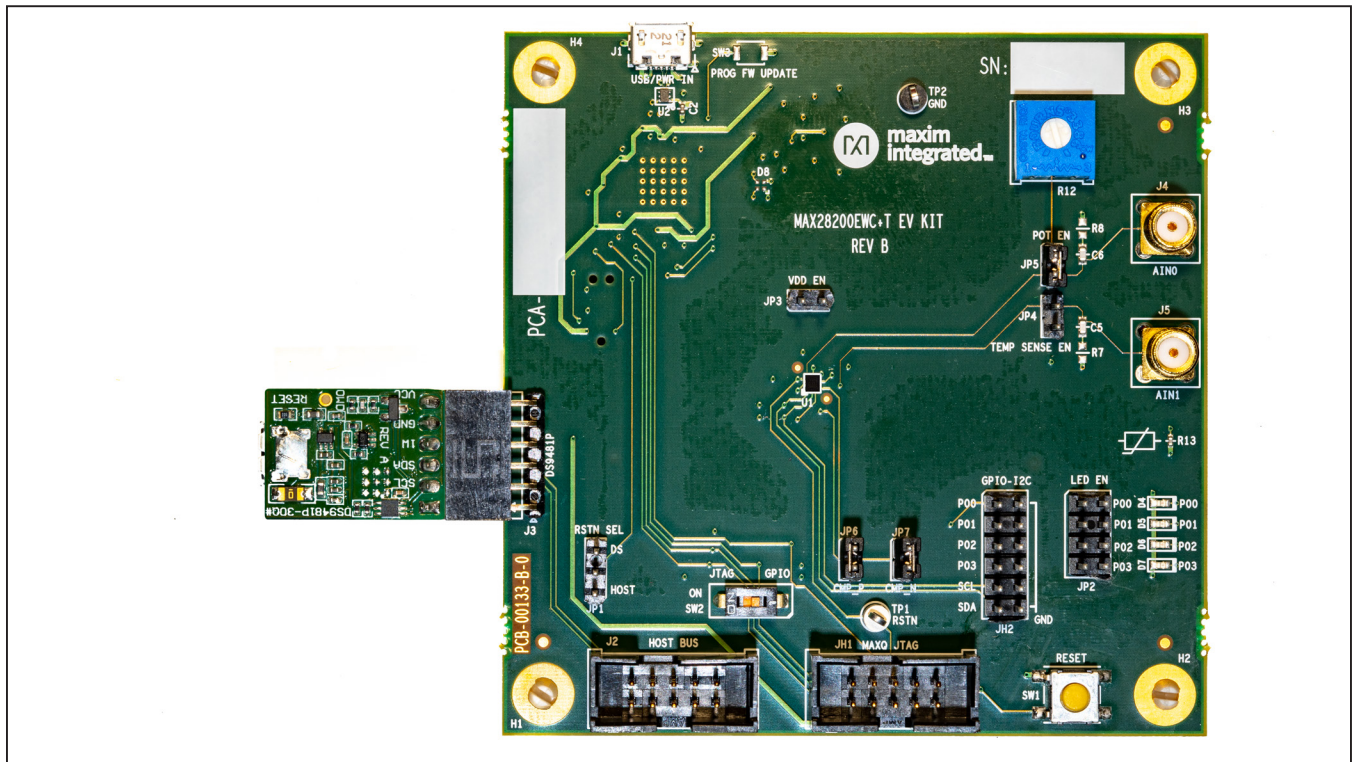
- MAX28200 EV Kit Board with a Sample Device Preprogrammed with Demo
- DS9481P-300# Programming Tool
- USB Type A to Micro-B Cable

Features

- MAX28200 Microcontroller
 - MAXQ20 16-Bit Core
 - 16KB Flash Memory
 - 2KB SRAM
 - PWM/Timer
 - 2-Channel, 10-Bit ADC
 - I²C
 - Hardware SHA-3 Engine
 - Comparator
- Integrated Peripherals
 - Status LEDs
 - Temperature Sensor
 - Potentiometer

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

MAX28200 EV Kit Board



Quick Start

The EV kit is fully assembled, tested, and preprogrammed with demo firmware. Follow the steps below to begin evaluation:

- 1) Inspect the installed jumpers, which should match the defaults specified in [Table 1](#).
- 2) Set the switch, SW2, to GPIO mode (open).
- 3) Power the board by connecting the supplied USB cable to a PC or USB 5V source.
- 4) Verify that the demo is running by observing the LEDs blink in a pattern.
- 5) Evaluate the analog input by turning potentiometer R12 and observe the LEDs change.
- 6) If desired, press the RESET button to start over.

Detailed Description of Hardware

The MAX28200 EV kit board is designed to make developing with the MAX28200 quick and easy. In addition to making all the GPIOs accessible at 100-mil pitch headers, the EV kit also offers programming access to flash memory using a ROM resident bootloader. Electrical interface to the bootloader is by JTAG or I²C. I²C can be accessed through connectors for a host bus adapter or the included DS9481P programming tool. Configurable status LEDs and a thermistor plus potentiometer provide a convenient way to monitor port activity and exercise the ADC/comparator block.

Table 1. Jumper Settings

| JUMPER | FUNCTION | SETTINGS | DESCRIPTION |
|--------|---------------|----------|--|
| JP1 | RSTN SEL | 1-2 | Allows host bus adapter to assert a reset. |
| | | 2-3* | Allows DS9481P to assert a reset. |
| JP2 | LED EN | 1-2 | PORT 0 LED enabled active-low. |
| | | 3-4 | PORT 1 LED enabled active-low. |
| | | 5-6 | PORT 2 LED enabled active-low. |
| | | 7-8 | PORT 3 LED enabled active-low. |
| JP3 | VDD EN | 1-2* | Connects 3V3 power to DUT. |
| | | 2-3 | Open to provide DUT current monitoring. |
| JP4 | TEMP SENSE EN | 1-2 | Connects thermistor voltage-divider network to AIN1. |
| | | Open* | Open to apply external signals through J5 SMA. |
| JP5 | POT EN | 1-2 | Connects POT voltage-divider network to AIN0. |
| | | Open* | Open to apply external signals through J4 SMA. |
| JP6 | CMP_P | 1-2* | Normal JTAG and GPIO functions available. |
| | | Open | Pin 1 of header provides direct path to comparator P for high-Z sources. |
| JP7 | CMP_N | 1-2* | Normal JTAG and GPIO functions available. |
| | | Open | Pin 1 of header provides direct path to comparator N for high-Z sources. |

*Default jumper setting.

Power Supply

System power can be supplied by USB, the host bus adapter, or the DS9481P programming tool. Automatic source switching and voltage regulation is provided for the MAX28200.

Programming

A ROM resident bootloader provides access to flash memory by way of JTAG or I²C. I²C communication is handled through connectors for a host bus adapter, the DS9481P programming tool, or direct header connection.

JTAG/GPIO Mux

The four GPIOs provided on the MAX28200 double as JTAG connections. Switch SW2 controls routing of the

GPIOs. Closing SW2 enables JTAG mode, and opening SW2 enables GPIO mode.

Status LEDs

User-configurable status LEDs are provided for each GPIO. Jumpers provide an easy and positive way to deactivate LEDs when not needed.

Comparator and ADC

The comparator and 10-bit, dual-channel ADC are accessed through SMA connectors J4 and J5. An on-board NTC thermistor and potentiometer can also be connected to these analog inputs. Jumpers JP6 and JP7 provide an alternate path to the comparators for high-Z signals. Install shunts for normal GPIO operation.

Ordering Information

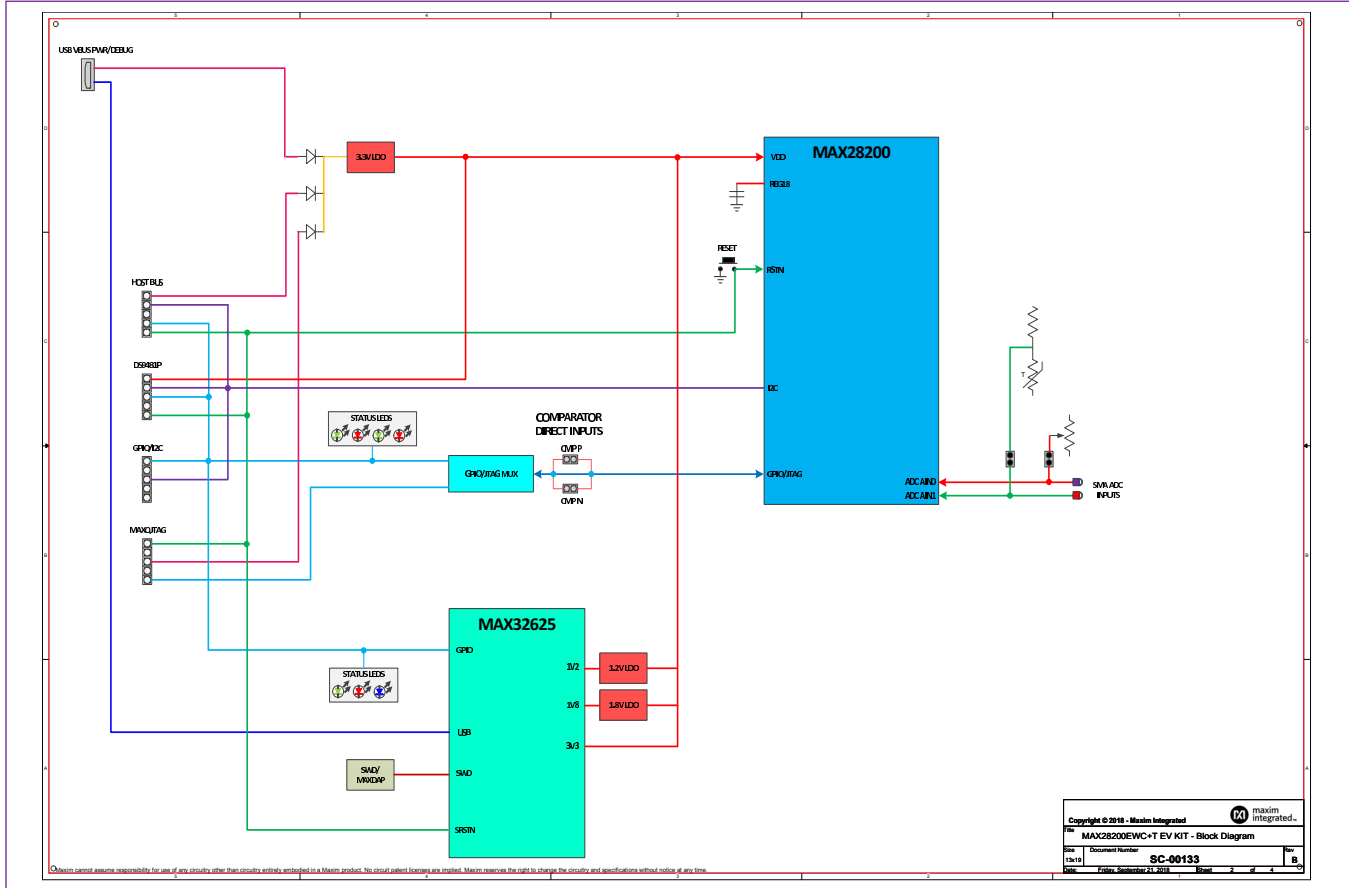
| PART | TYPE |
|-----------------|--------|
| MAX28200WEVKIT# | EV Kit |

#Denotes RoHS compliant.

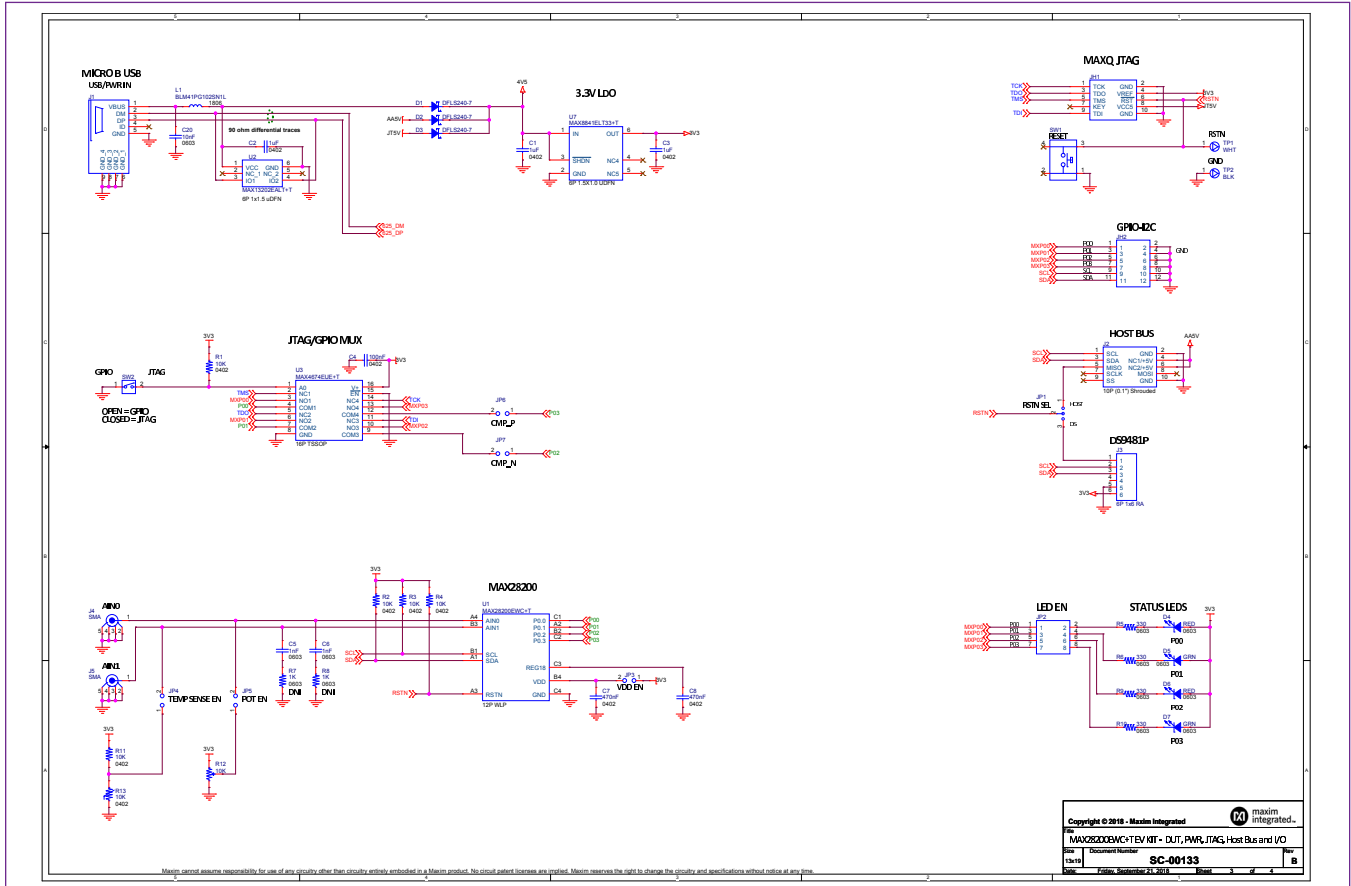
MAX28200 EV Kit Bill of Materials

| QTY | PART REFERENCE | VALUE | BOM_DESCRIPTION | MANUFACTURER_PN | MANUFACTURER |
|-----|---|--------------------|--|--------------------|----------------------------------|
| 11 | C1,C2,C3,C9,C10,C14,C15,C16,C17,C18,C19 | 1uF | CAP CER 1UF 6.3V X5R 0402 | GRM155R60J105KE19D | Murata |
| 1 | C4 | 100nF | CAP CER 0.1UF 16V 10% X7R 0402 | GRM155R71C104KA88D | Murata Electronics |
| 2 | C5,C6 | 1nF | CAP CER 1nF 50V 5% NP0 0603 | GRM1885C1H102JA01D | Murata |
| 2 | C7,C8 | 470nF | CAP CER 0.47UF 10V 10% X5R 0402 | GRM155R61A474KE15J | Murata Electronics North America |
| 2 | C11,C12 | 4.7uF | CAP CER 4.7uF 10V 10% X5R 0603 | C0603C475K8PACTU | Kemet |
| 1 | C13 | 10nF | CAP CER 10000PF 16V 10% X7R 0402 | GRM155R71C103KA01D | Murata Electronics North America |
| 1 | C20 | 10nF | CAP CER 10nF 25V 10% X7R 0603 | GRM188R71E103KA01D | Murata |
| 3 | D1,D2,D3 | DFLS240-7 | DIODE SCHOTTKY 40V 2A POWERDI12 | DFLS240-7 | Diodes Inc |
| 2 | D4,D6 | RED | LED SMARTLED RED 633NM 0603 | LS L296-P2Q2-1-Z | OSRAM Opto Semiconductors Inc |
| 2 | D5,D7 | GRN | LED SMARTLED GREEN 570NM 0603 | LG L29K-G2J1-24-Z | OSRAM Opto Semiconductors Inc |
| 1 | D8 | SML-LX0404SIUPGUSB | LED RGB CLEAR 0404 SMD | SML-LX0404SIUPGUSB | Lumex Opto/Components Inc. |
| 4 | H1,H2,H3,H4 | DNI | DNI MTG 125DRL 300PAD | | |
| 1 | J1 | MICRO USB B R/A | CONN RCPT 5POS MICRO USB B R/A | 47346-0001 | Molex |
| 1 | J2 | HOST I2C SPI | HOST I2C SPI 10P HEADER | 5104338-1 | TE Connectivity |
| 1 | J3 | 6P 1x6 RA | CONN HEADER .100" SNGL R/A 6POS | PRPC006SBCN-M71RC | Sullins |
| 2 | J4,J5 | SMA | CONN SMA JACK STR 50 OHM PCB | 5-1814832-1 | TE Connectivity |
| 1 | J6 | MAXDAP | MAXDAP_POGO_PIN CBL PLUG-OF-NAILS 10-PIN | TC2050-IDC-NL | Tag-Connect LLC |
| 1 | JH1 | JTAG MAXQ | CONN HEADER LOPRO STR 10POS GOLD | 5104338-1 | TE Connectivity |
| 1 | JH2 | 12P 2x6 | CONN HEADER .100 DUAL STR 12POS | PEC06DAAN | Sullins |
| 1 | JP1 | 3P JUMPER | CONN HEADER .100 SNGL STR 3POS | PEC03SAAN | Sullins |
| 1 | JP2 | 8P 2x4 | CONN HEADER .100 DUAL STR 8POS | PEC04DAAN | Sullins |
| 5 | JP3,JP4,JP5,JP6,JP7 | JUMPER | CONN HEADER .100 SNGL STR 2POS (2x1) | PEC02SAAN | Sullins |
| 1 | L1 | BLM41PG102SN1L | FERRITE CHIP 1K OHM 1500MA 1806 | BLM41PG102SN1L | Murata Electronics |
| 1 | PCB1 | PCB | | | |
| 7 | R1,R2,R3,R4,R11,R14,R15 | 10K | RES SMD 10K OHM 1% 1/16W 0402 | RC0402FR-0710KL | Yageo |
| 4 | R5,R6,R9,R10 | 330 | RES SMD 330 OHM 1% 1/10W 0603 | ERJ-3EKF3300V | Panasonic |
| 2 | R7,R8 | 1K | RES 1K OHM 1/10W 1% 0603 SMD | ERJ-3EKF1001V | Panasonic |
| 1 | R12 | 10K | TRIMMER 10K OHM 0.5W PC PIN | 3386P-1-103LF | Bourns Inc. |
| 1 | R13 | 10K | NTC THERMISTOR 10K OHM 1% 0402 | NCP15XH103F03RC | Murata Electronics North America |
| 1 | R16 | 2.7K | RES SMD 2.7K OHM 1% 1/10W 0402 | ERJ-2RKF2701X | Panasonic |
| 1 | R17 | 1.4K | RES SMD 1.4K OHM 1% 1/10W 0402 | ERJ-2RKF1401X | Panasonic Electronic Components |
| 1 | R18 | 1K | RES 1K OHM 1/10W 1% 0402 SMD | ERJ-2RKF1001X | Panasonic |
| 1 | SW1 | B3S-1002 BY OMZ | SWITCH TACTILE SPST-NO 0.05A 24V | B3S-1002 BY OMZ | Omron Electronics |
| 1 | SW2 | DIP SW 1POS | SWITCH AUTODIP 1POS TOP ACT 24V | A6T-1104 | Omron Electronics |
| 1 | SW3 | B3U-1000P | SWITCH TACTILE SPST-NO 0.05A 12V | B3U-1000P | Omron Electronics |
| 1 | TP1 | WHT | TEST POINT PC MULTI PURPOSE WHT | 5012 | Keystone Electronics |
| 1 | TP2 | BLK | TEST POINT PC MULTI PURPOSE BLK | 5011 | Keystone Electronics |
| 1 | U1 | MAX28200EWC+T | MAX28200EWC+T 12P_WLP | MAX28200EWC+T | Maxim Integrated |
| 1 | U2 | MAX13202EALT+T | ESD PROTECT 2CH 6-UDFN | MAX13202EALT+ | Maxim Integrated |
| 1 | U3 | MAX4674EUE+T | IC MULTIPLEXER QUAD 2X1 16TSSOP | MAX4674EUE+T | Maxim Integrated |
| 1 | U4 | MAX8841ELT18+T | IC REG LINEAR 1.8V 150MA 6UDFN | MAX8841ELT18+T | Maxim Integrated |
| 1 | U5 | MAX32625ITK+ | MAX32625ITK+ 68P TQFN | MAX32625ITK+ | Maxim Integrated |
| 1 | U6 | MAX38902AATA+ | IC REG LDO LINEAR ADJ .5A 8TDFN | MAX38902AATA+ | Maxim Integrated |
| 1 | U7 | MAX8841ELT33+T | IC REG LINEAR 3.3V 150MA 6UDFN | MAX8841ELT33+T | Maxim Integrated |
| 1 | Y1 | 32.768KHz | CRYSTAL 32.7680KHZ 6PF SMD | ECS-.327-6-12-TR | ECS Inc. |

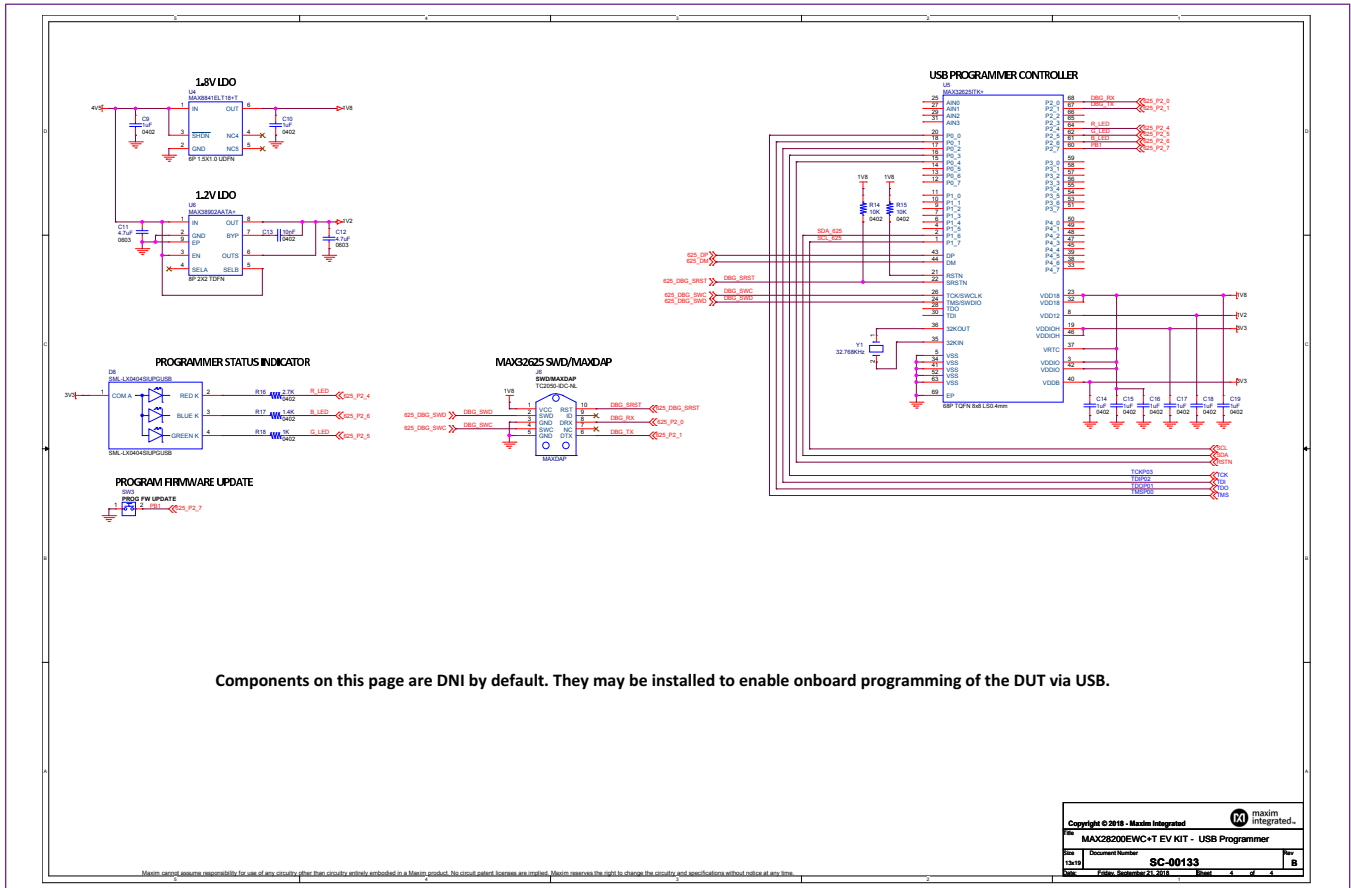
MAX28200 EV Kit Schematics



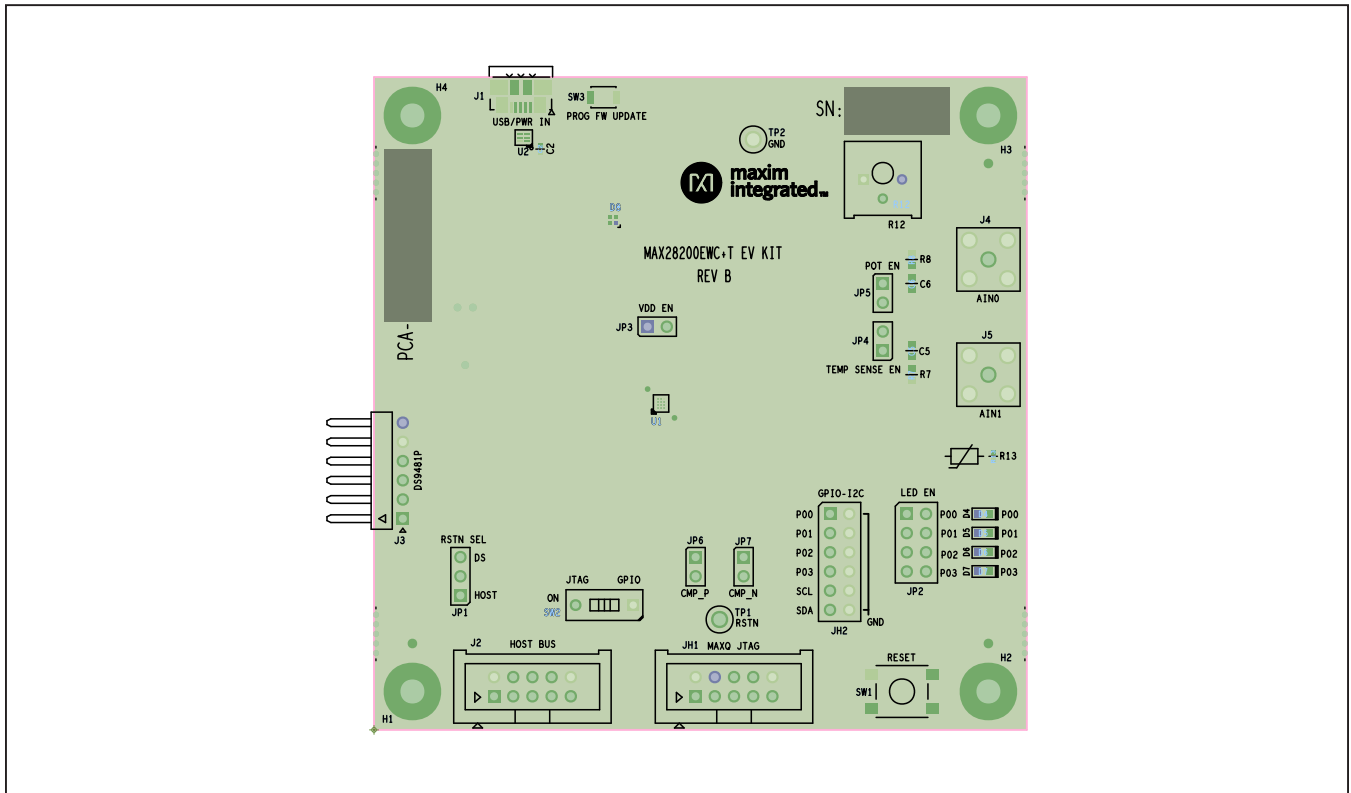
MAX28200 EV Kit Schematics (continued)



MAX28200 EV Kit Schematics (continued)



MAX28200 EV Kit PCB Assembly Layout



Revision History

| REVISION NUMBER | REVISION DATE | DESCRIPTION | PAGES CHANGED |
|-----------------|---------------|-----------------|---------------|
| 0 | 1/19 | Initial release | — |

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