

## Evaluates: MAX32672

## MAX32672 Evaluation Kit

### General Description

The MAX32672 evaluation kit (EV kit) provides a platform for evaluating the capabilities of the MAX32672 microcontroller, which is a small, high-reliability, ultra-low power, 32-bit microcontroller. The MAX32672 is a secure and cost-effective solution for motion/motor control, industrial sensors, and battery-powered medical devices and offers legacy designs an easy, cost-optimal upgrade path from 8-bit or 16-bit microcontrollers.

### EV Kit Contents

- MAX32672 EV Kit Containing a MAX32672 with a Preprogrammed Demo
- MAX32625PICO Debugger with Cables
- One Standard A-to-Micro B USB Cable

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

### Benefits and Features

- Selectable, On-Board, High-Precision Voltage Reference
- 128 x 128 (1.45in) Color TFT Display with SPI Interface
- USB 2.0 Micro B-to-Serial UARTs
- UART0 and LPUART0 Interface Is Selectable through On-Board Jumpers
- All GPIOs Signals Accessed through 0.1in Headers
- 12 Analog Inputs Accessed through 0.1in Headers with Optional Filtering
- 10-Pin Arm® Cortex® SWD Connector
- Board Power Provided by USB Port
- On-Board, 3.3V LDO Regulator
- Test Loops Provided to Supply Optional VCORE Power Externally
- Individual Power Measurement on All IC Rails through Jumpers
- Two General-Purpose LEDs and One General-Purpose Pushbutton Switch

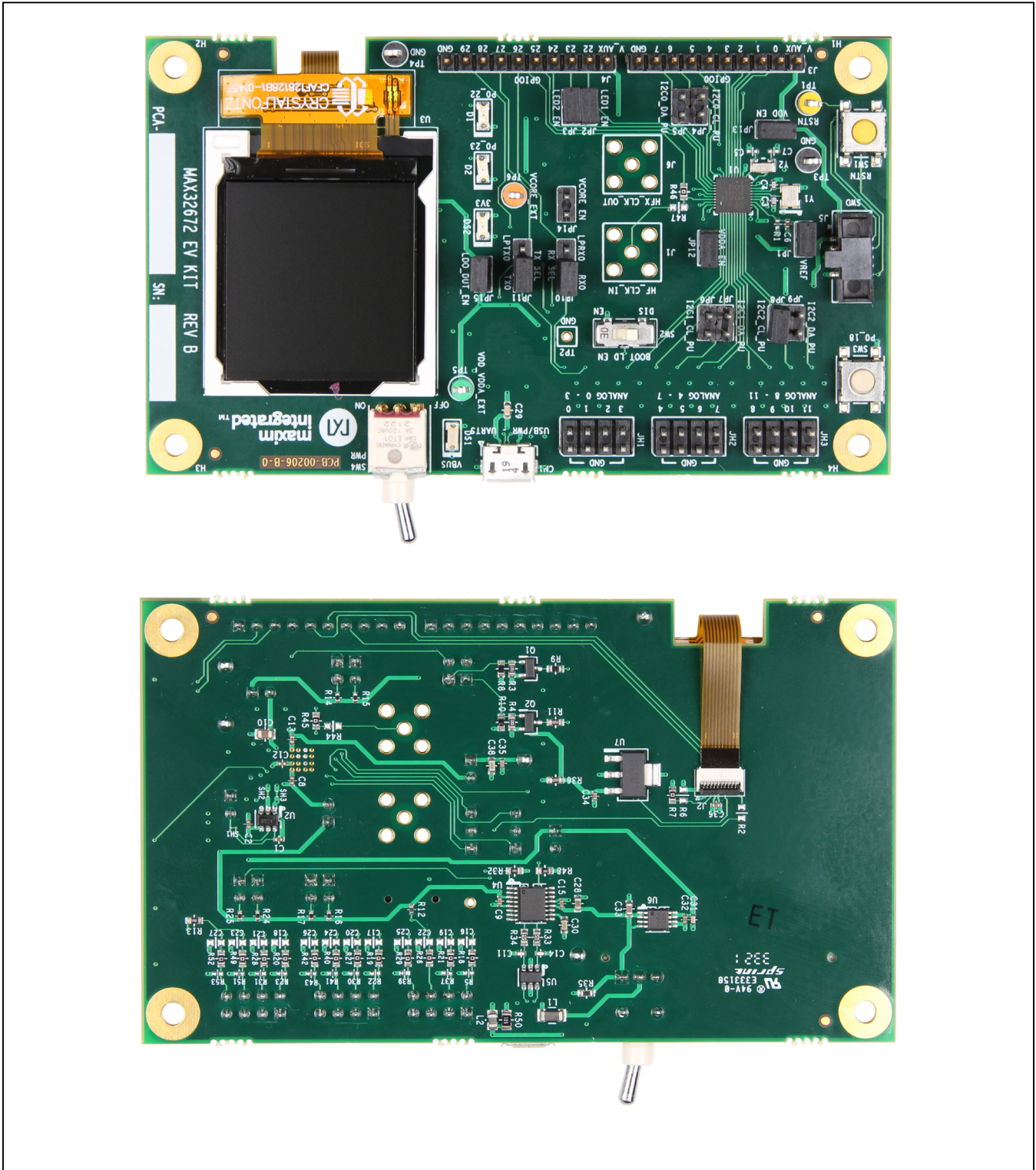
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319-100779; Rev 1; 6/22

# MAX32672 Evaluation Kit

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## MAX32672 EV Kit Board



## Quick Start

### Required Equipment

- MAX32672 EV kit containing a MAX32672 with a preprogrammed demo
- One Standard A-to-Micro B USB cable

### Procedure

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

- 1) While observing safe ESD practices, carefully remove the MAX32672 EV kit board out of its packaging. Inspect the board to ensure that no damage occurred during shipment. Jumpers/shunts are preinstalled prior to testing and packaging.
- 2) Power up the board by plugging in the provided USB cable to connector CN1. Verify that the VBUS blue LED (DS1) and the 3V3 (DS2) green LED are illuminated.
- 3) The MAX32672 is preprogrammed with a demo program. The program will now initiate and display the Maxim logo upon successful completion.

## Detailed Description of Hardware

### Power Supply

The EV kit is powered by +5V, which is made available through VBUS on the Micro USB type-B connector CN1. The blue VBUS LED (DS1) and the green 3.3V LED will illuminate when the board is powered.

### Single- or Dual-Supply Operation

The EV kit is configured for single-supply operation. For dual-supply operation, install a jumper on JP14 and connect an external supply to TP6 (VCORE\_EXT) and ground. Refer to the MAX32672 data sheet for acceptable voltage values.

### Current Monitoring

Two pin headers provide convenient current monitoring points for VDDA EN (JP12), VDD EN (JP13), and VCORE EN (JP14). JP14 is only used for current measurements when VCORE is supplied externally.

### Low-Power Mode Current Measurements

To accurately achieve the low-power current values, the EV kit must be configured such that no outside influence (such as a pullup, external clock, or debugger connector) causes a current source or sink on that GPIO.

For these measurements, the board will be needed to be configured as follows:

- 1) Remove jumpers JP2 through JP11.

*Windows is a registered trademark of Microsoft Corporation.*

- 2) Set SW2 to the DIS position and remove resistor R12.
- 3) Unplug the SWD connector.

### Clocking

The MAX32672 clocking is provided by an external 16MHz crystal (Y1).

### External Voltage Reference

The external voltage reference input VREF for the ADC can be sourced externally by a high-precision external reference source (the MAX6071). VREF (JP1) allows the external reference to be disconnected so that VREF can be sourced internally by VDDA.

### JTAG Serial Wire Debug (SWD) Support

SWD debug can be accessed through an Arm Cortex 10-pin connector (J5). Logic levels are set to 3V3 by default, but they can be set to 1.8V if TP5 (VDD\_VDDA\_EXT) is supplied externally. Be sure to remove jumper JP15 (LDO\_DUT\_EN) to disconnect the 3.3V LDO if supplying VDD and VDDA externally.

### UART Interface

The EV kit provides a USB-to-UART bridge chip (the FTDI FT230XS-R). This bridge eliminates the requirement for a physical RS-232 COM port. Instead, the IC's UART access is through the Micro USB type-B connector (CN1). The USB-to-UART bridge can be connected to the IC's UART0 or LPUART0 with jumpers JP10 (RX0) and JP11 (TX0). Virtual COM port drivers and guides for installing Windows® drivers are available on the [FTDI Chip website](#).

### Boot Loader

The boot loader is activated by the boot-load-enable slide switch (SW2). This pulls P0\_10 low and, upon a power cycle or reset, the device will enter boot loader mode.

### GPIO and Alternate Function Headers

GPIO and alternate function signals from the MAX32672 can be accessed through 0.1in-spaced headers J3 and J4.

### Analog Headers

The 12 analog inputs can be accessed through 0.1in-spaced headers JH1, JH2, and JH3.

### I<sup>2</sup>C Pullups

The I<sup>2</sup>C ports can independently be pulled up to V\_AUX (3.3V default) through JP4 (I2C0\_CL\_PU) and JP5 (I2C0\_DA\_PU), JP6 (I2C1\_CL\_PU) and JP7 (I2C1\_DA\_PU), and JP8 (I2C2\_CL\_PU) and JP9 (I2C2\_DA\_PU).

### Reset Pushbutton

The IC can be reset by pushbutton SW1.

**Indicator LEDs**

The general-purpose indicator LED D1 (red) is connected to GPIO P0.22, and LED D2 (green) is connected to GPIO P0.23.

**GPIO Pushbutton Switches**

The general-purpose pushbutton (SW3) is connected to GPIO P0.18. If the pushbutton is pressed, the attached port pin is pulled low.

**Table 1. MAX32672 EV Kit Jumper Settings**

JUMPER	SIGNAL	SETTINGS	DESCRIPTION
JP1	VREF	Open	Disconnects on-board, high-precision voltage reference
		Closed*	Connects on-board, high-precision voltage reference
JP2	P0_22	Open	Disconnects red LED D1 from P0_22
		Closed*	Connects red LED D1 to P0_22
JP3	P0_23	Open	Disconnects green LED D2 from P0_23
		Closed*	Connects green LED D2 to P0_23
JP4	I2C0_SCL	Open*	Disconnects 2.2K pullup sourced by 3V3 from I2C0_SCL
		Closed	Connects 2.2K pullup sourced by 3V3 to I2C0_SCL
JP5	I2C0_SDA	Open*	Disconnects 2.2K pullup sourced by 3V3 from I2C0_SDA
		Closed	Connects 2.2K pullup sourced by 3V3 to I2C0_SDA
JP6	I2C1_SCL	Open*	Disconnects 2.2K pullup sourced by 3V3 from I2C1_SCL
		Closed	Connects 2.2K pullup sourced by 3V3 to I2C1_SCL
JP7	I2C1_SDA	Open*	Disconnects 2.2K pullup sourced by 3V3 from I2C1_SDA
		Closed	Connects 2.2K pullup sourced by 3V3 to I2C1_SDA
JP8	I2C2_SCL	Open	Disconnects 2.2K pullup sourced by 3V3 from I2C2_SCL
		Closed*	Connects 2.2K pullup sourced by 3V3 to I2C2_SCL
JP9	I2C2_SDA	Open*	Disconnects 2.2K pullup sourced by 3V3 from I2C2_SDA
		Closed	Connects 2.2K pullup sourced by 3V3 to I2C2_SDA
JP10	UART_RX	2-1*	Connects the USB serial bridge to UART0_RX (P0.8)
		2-3	Connects the USB serial bridge to LUART0_RX (P0.26)
JP11	UART_TX	2-1*	Connects the USB serial bridge to UART0_TX (P0.9)
		2-3	Connects the USB serial bridge to LUART0_TX (P0.27)
JP12	VDDA	Open	Disconnects power from VDDA
		Closed*	Connects power to VDDA
JP13	VDD	Open	Disconnects power from VDD
		Closed*	Connects power to VDD
JP14	VCORE	Open*	Disconnects power from VCORE from an external power supply through test loop TP6
		Closed	Connects power to VCORE from an external power supply through test loop TP6
JP15	LDO DUT	Open	Disconnects power from 3.3V LDO
		Closed*	Connects power to 3.3V LDO

\*Default

**Ordering Information**

PART	TYPE
MAX32672EVKIT#	EV Kit

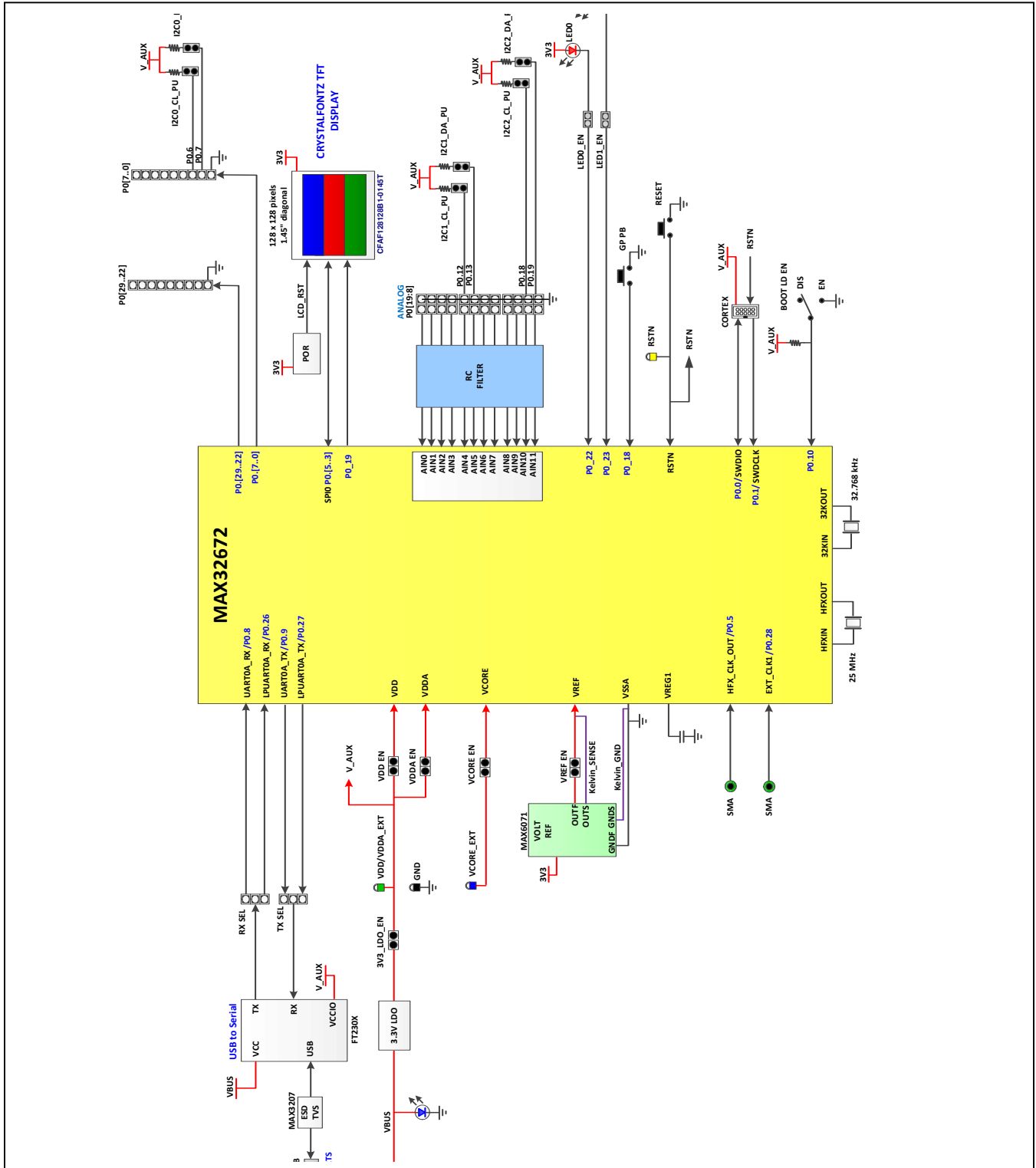
#Denotes RoHS compliant.



MAX32672 EV Kit Bill of Materials

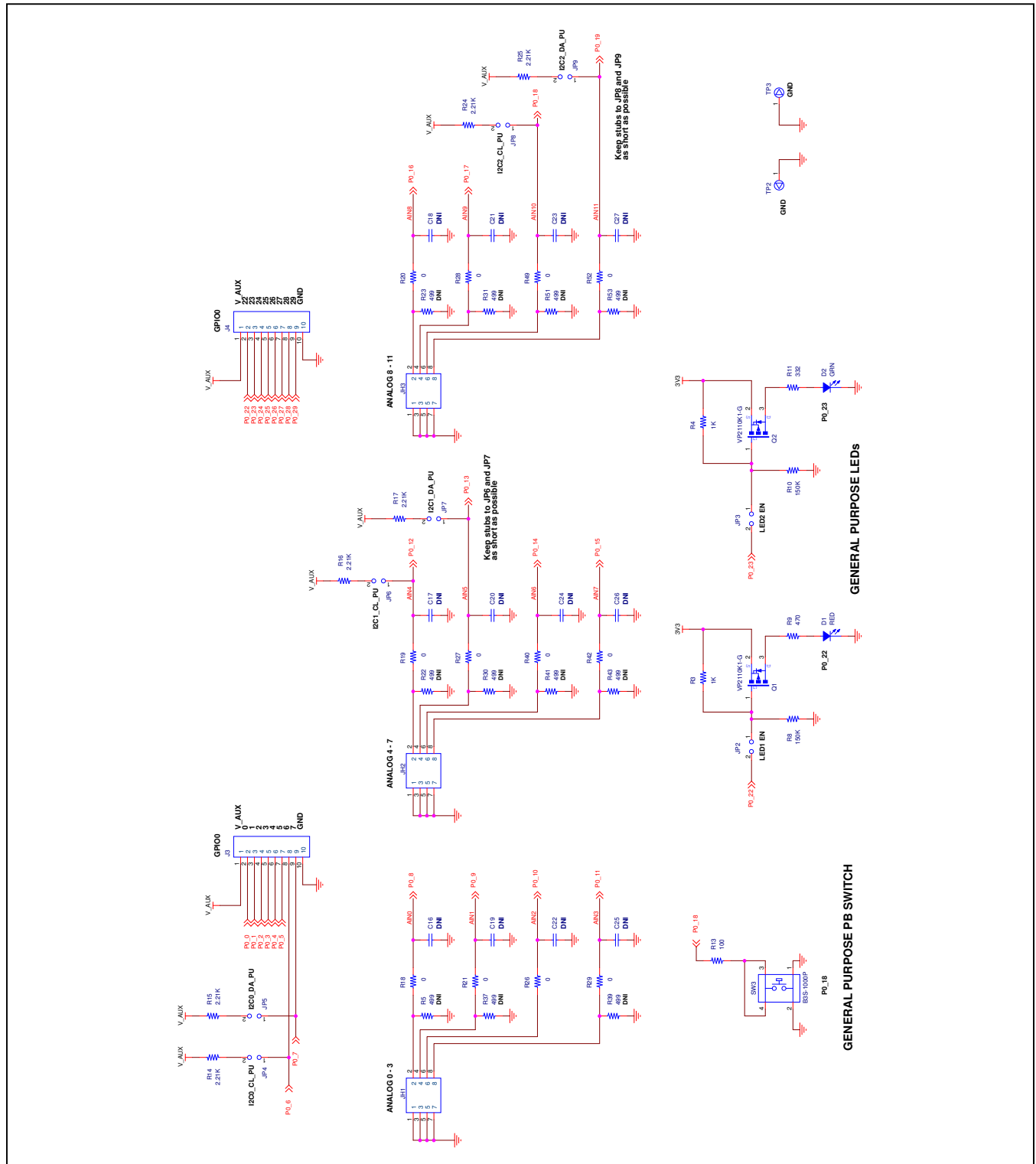
QTY	VALUE	PART REFERENCE	BOM DESCRIPTION	MANUFACTURER_PN	MANUFACTURER
4	100nF	C1 C2 C34 C36	CAP CER 0.1UF 16V 10% X7R 0402	GRM155R71C104KA88D	Murata Electronics
2	12pF	C3 C4	CAP CER 12PF 50V 5% NP0 0402	CL05C120JB5NNNC	Samsung Electro-Mech
14	DNI	C5 C7 C16 C17 C18 C19 C20 C21 C22 C23 C24 C25 C26 C27	DNI		
3	1uF	C6 C8 C13	CAP CER 1UF 16V 10% X5R 0402	GRT155R61C105KE01D	Murata Electronics
4	100nF	C9 C15 C32 C35	CAP CER 0.1UF 10V 10% X5R 0402	GRM155R61A104KA01D	Murata
1	4.7uF	C10	CAP CER 4.7UF 10V10% X7R 0805	GRM21BR71A475KA73K	Murata Electronics
2	47pF	C11 C14	CAP CER 47PF 50V 1% NP0 0402	C1005C0G1H470F050BA	TDK Corporation
1	4.7nF	C12	CAP CER 4700PF 50V 5% X7R 0402	GRM155R71H472JA01D	Murata Electronics
1	4.7uF	C28	CAP CER 4.7UF 10V 10% X5R 0603	C0603C475K8PACTU	Kemet
1	10nF	C29	CAP CER 10000PF 25V 10% X7R 0603	CL10B103KA8NNNC	Samsung Electro-Mech
1	100nF	C30	CAP CER 0.1UF 16V 10% X7R 0603	C0603C104K4RACTU	Kemet
1	10uF	C31	CAP CER 10UF 6.3V 20% X5R 0402	GRJ155R60J106ME11D	Murata Electronics
1	1uF	C33	CAP CER 1UF 35V 10% X5R 0603	GМК107BJ105KA-T	Taiyo Yuden
1	10uF	C38	CAP CER 10UF 6.3V 20% X5R 0603	CL10A106MQ8NNNC	Samsung Electro-Mech
1	MICRO USB B R/A	CN1	CONN RCPT 5POS MICRO USB B R/A	47346-0001	Molex
1	RED	D1	LED 660NM RED WTR CLR 1206 SMD	SML-LX1206SRC-TR	Lumex Opto
2	GRN	D2 DS2	LED 565NM WTR CLR GREEN 1206 SMD	SML-LX1206GC-TR	Lumex Opto
1	BLUE	DS1	LED 469NM BLUE DIFF 1206 SMD	HSMR-C150	Avago Technologies
4	DNI	H1 H2 H3 H4	DNI MTG 125DRL 300PAD		
2	SMA	J1 J6	CONN SMA JACK STR 50 OHM PCB	901-10112	Amphenol RF
1	503480-1000	J2	CONN FFC FPC 10POS 0.50MM R/A	503480-1000	Molex, LLC
2	10P 1x10	J3 J4	CONN HEADER .100 SINGL STR 10POS	PEC10SAAN	Sullins
1	10P CORTEX DEBUG	J5	IDC BOX HEADER 0.050 10 POS SMD	3220-10-0300-00	CNC Tech
3	8P 2x4	JH1 JH2 JH3	CONN HEADER .100 DUAL STR 8POS	PEC04DAAN	Sullins
13	JUMPER	JP1 JP2 JP3 JP4 JP5 JP6 JP7 JP8 JP9 JP12 JP13 JP14 JP15	CONN HEADER .100 SINGL STR 2POS	PEC02SAAN	Sullins
2	3P 3x1	JP10 JP11	CONN HEADER .100 SINGL STR 3POS	PEC03SAAN	Sullins
1	HZ1206C202R-10	L1	FERRITE CHIP SIGNAL 2000 OHM SMD	HZ1206C202R-10	Laird-Signal Integrity
1	BLM21PG221SN1D	L2	FERRITE CHIP 220 OHM 0805	BLM21PG221SN1D	Murata Electronics
1	PCB	PCB1			
2	VP2110K1-G	Q1 Q2	MOSFET P-CH 100V 0.12A SOT23-3	VP2110K1-G	Microchip
1	DNI	R1	DNI 0402		
3	0	R2 R44 R47	RES SMD 0 OHM JUMPER 1/10W 0603	RC0603JR-070RL	Yageo
2	1K	R3 R4	RES 1K OHM 1/10W 1% 0603 SMD	ERJ-3EKF1001V	Panasonic
11	499	R5 R22 R23 R30 R31 R37 R39 R41 R43 R51 R53	RES SMD 499 OHM 1% 1/10W 0402	ERJ-2RKF4990X	Panasonic
1	10K	R6	RES 10K OHM 1/10W 1% 0603 SMD	ERJ-3EKF1002V	Panasonic
15	0	R7 R18 R19 R20 R21 R26 R27 R28 R29 R40 R42 R45 R46 R49 R52	RES SMD 0 OHM JUMPER 1/10W 0603	RC0603JR-070RL	Yageo
2	150K	R8 R10	RES 150K OHM 1/10W 1% 0603 SMD	ERJ-3EKF1503V	Panasonic
1	470	R9	RES 470 OHM 1/10W 1% 0603 SMD	ERJ-3EKF4700V	Panasonic
2	332	R11 R36	RES 332 OHM 1/10W 1% 0603 SMD	ERJ-3EKF3320V	Panasonic
1	10K	R12	RES SMD 10K OHM 1% 1/16W 0402	RC0402FR-0710KL	Yageo
1	100	R13	RES SMD 100 OHM 1% 1/10W 0603	RC0603FR-07100RL	Yageo
6	2.21K	R14 R15 R16 R17 R24 R25	RES SMD 2.21K OHM 1% 1/10W 0402	ERJ-2RKF2211X	Panasonic
2	10K	R32 R48	RES 10K OHM 1/10W 1% 0603 SMD	ERJ-3EKF1002V	Panasonic
2	27	R33 R34	RES 27 OHM 1/10W 1% 0603 SMD	ERJ-3EKF27R0V	Panasonic
1	2.7K	R35	RES 2.7K OHM 1/10W 1% 0603 SMD	ERJ-3EKF2701V	Panasonic
1	1M	R50	RES SMD 1M OHM 5% 1/8W 0805	ERJ-6GEYJ105V	Panasonic
3	DNI	SH1 SH2 SH3	DNI 2 NET SHORT		
1	B3S-1002 BY OMZ	SW1	SWITCH TACTILE SPST-NO 0.05A 24V	B3S-1002 BY OMZ	Omron Electronics
1	CL-SB-12A-01T	SW2	SWITCH SLIDE SPDT 200MA 12V	CL-SB-12A-01T	Nidec Copal Electronics
1	B3S-1000P	SW3	SWITCH TACTILE SPST-NO 0.05A 24V	B3S-1000P	Omron Electronics
1	SPDT 3A	SW4	SWITCH TOGGLE SPDT 3A 120V	ET01MD1AGE	C&K Components
1	YLW	TP1	TEST POINT PC MULTI PURPOSE YEL	5014	Keystone Electronics
1	1P	TP2	CONN HEADER .100 SINGL STR 1POS	PEC01SAAN	Sullins
2	BLK	TP3 TP4	TEST POINT PC MULTI PURPOSE BLK	5011	Keystone Electronics
1	GRN	TP5	TEST POINT PC MULTI PURPOSE GRN	5126	Keystone Electronics
1	ORG	TP6	TEST POINT PC MULTI PURPOSE ORG	5013	Keystone Electronics
1	MAX32672GTL+	U1	MAX32672GTL+ 40P TQFN	MAX32672GTL+	Maxim Integrated
1	MAX6071AAUT21+T	U2	IC VREF SERIES 0.04% SOT23-6	MAX6071AAUT21+T	Maxim Integrated
1	CFAF128128B1-0145T	U3	LCD TFT Full Color 1.45" 128x128	CFAF128128B1-0145T	Crystalfontz
1	FT230XS-R	U4	IC USB SERIAL BASIC UART 16SSOP	FT230XS-R	FTDI
1	MAX3207EAUT+T	U5	ESD PROT DIFF SOT23-6	MAX3207EAUT+T	Maxim Integrated
1	MAX1806EUA33+	U6	IC REG LDO 3.3V/ADJ 0.5A 8UMAX	MAX1806EUA33+	Maxim Integrated
1	DS1233AZ-10+T&R	U7	IC SUPERVISOR 1 CHANNEL SOT223-3	DS1233AZ-10+T&R	Maxim Integrated
1	25MHz	Y1	CRYSTAL 25.000MHZ 12PF SMD	CX3225SB25000H0FLJCC	Kyocera International
1	32.768kHz	Y2	CRYSTAL 32.768KHZ 6.0PF SMD	ABS07-32.768KHZ-6-T	Abracon Corp

MAX32672 EV Kit Schematic





MAX32672 EV Kit Schematic (continued)









Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	6/21	Initial release	—
1	6/22	Updated board photo, <i>Detailed Description of Hardware</i> , and schematic	2-4, 6-11



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