

## Evaluates: MAX32672

## MAX32672FTHR Application Platform

### General Description

The MAX32672FTHR is a rapid development platform that helps engineers quickly implement complex sensor solutions using the MAX32672 Arm® Cortex®-M4. The board also includes the MAX8819 PMIC for battery and power management. The form factor is a small, 0.9in by 2.6in, dual row header footprint that is compatible with Adafruit® FeatherWing peripheral expansion boards. The board includes an OLED display, a RGB indicator LED, and a user pushbutton. The MAX32672FTHR provides a power-optimized flexible platform for quick proof-of-concepts and early software development to enhance time to market.

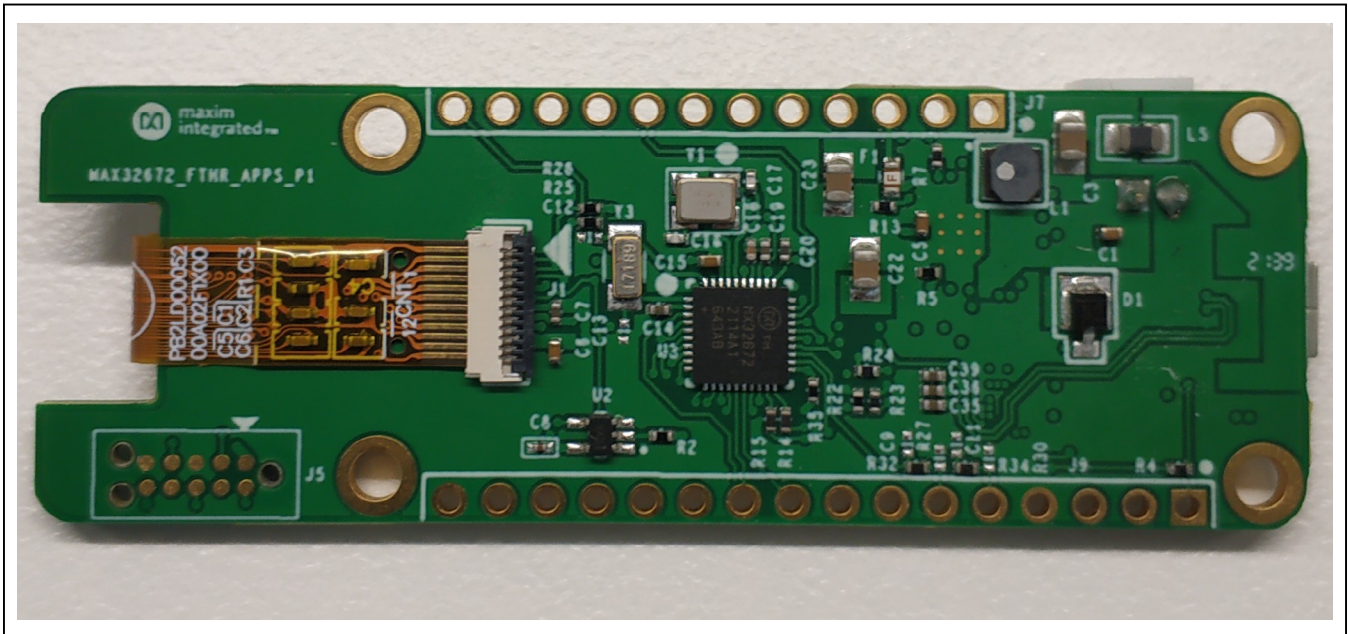
Refer to the [MAX32672FTHR](#) product page to get started developing with this board.

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

### Features

- MAX32672 Microcontroller
  - Arm Cortex-M4 Processor with FPU up to 100MHz
  - 1MB Dual-Bank Flash with Error Correction
  - 200KB SRAM (160KB with ECC Enabled)
  - 16KB Unified Cache with ECC
  - Resource Protection Unit (RPU)
  - Memory Protection Unit (MPU)
- Integrated Peripherals
  - MAX8819 PMIC with Integrated Charger
  - On-Board DAPLink Debug and Programming Interface for Arm Cortex-M4
  - Breadboard-Compatible Headers
  - Micro USB Connector
  - RGB Indicator LED
  - User Pushbutton
  - OLED Display
  - SWD Debugger
  - Virtual UART Console

### MAX32672FTHR Application Platform Board



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Arm and Cortex are registered trademarks of Arm Limited.

319-100876; Rev 0; 1/22

## Quick Start

Apply power to the MAX32672FTHR using the USB cable. The preprogrammed 'Hello World' demo will begin to execute. The RGB LED will start to blink green every second, and the MAX32672 will start to count every second. The counter messages can be observed from the Virtual UART Console.

## PMIC and Battery Charger

The MAX8819 PMIC powers the MAX32672FTHR board and is also capable of charging a Li-ion battery (not included). The MAX8819 has an internal MOSFET that connects the battery to system output when no voltage source is available on the charge input (USB). When an external source is detected at the charge input (USB), this switch opens and the system output is powered from the input source through the input current limiter. In addition, on-chip thermal limiting reduces the battery charge rate to prevent charger overheating.

When the system load requirements exceed the input current limit, the battery supplies supplemental current to the load through the internal system load switch. If the system load continuously exceeds the input current limit, the battery does not charge, even though external power is connected. This is not expected to occur in most cases because high loads usually occur only in short peaks. During these peaks, battery energy is used, but at all other times the battery charges.

The USB charge current is set to 200mA. This allows charging from both powered and unpowered USB hubs with no port communication required. Refer to the MAX8819 data sheet and the data sheet for your battery to ensure compatibility.

## Programming and Debugging

The MAX32625 microcontroller on the board is flashed with DAPLink firmware at the factory. It allows debugging and flashing the MAX32672 Arm Core over USB.

## Pushbuttons

There are three pushbuttons on the MAX32672FTHR board.

- SW2 – User-programmable function button connected to the MAX32672 Port 0.10.
- SW5 – Resets the MAX32672 through the RSTN input of the MAX32672.
- SW6 – DAPLink adapter button. Keep this button pressed while applying power to the board to put a MAX32625 DAPLink adapter on board to MAINTENANCE mode for DAPLink firmware updates.

## LEDs

There are 2 RGB LEDs on MAX32672FTHR board.

- D2 – DAPLink adapter MAX32625 status LED. Controlled by the DAPLink adapter and cannot be used as a user LED.
- D3 – Connected to the MAX32672FTHR GPIO ports. This LED can be controlled by user firmware.
  - Port 0.2: Red
  - Port 0.3: Green
  - Port 0.4: Blue

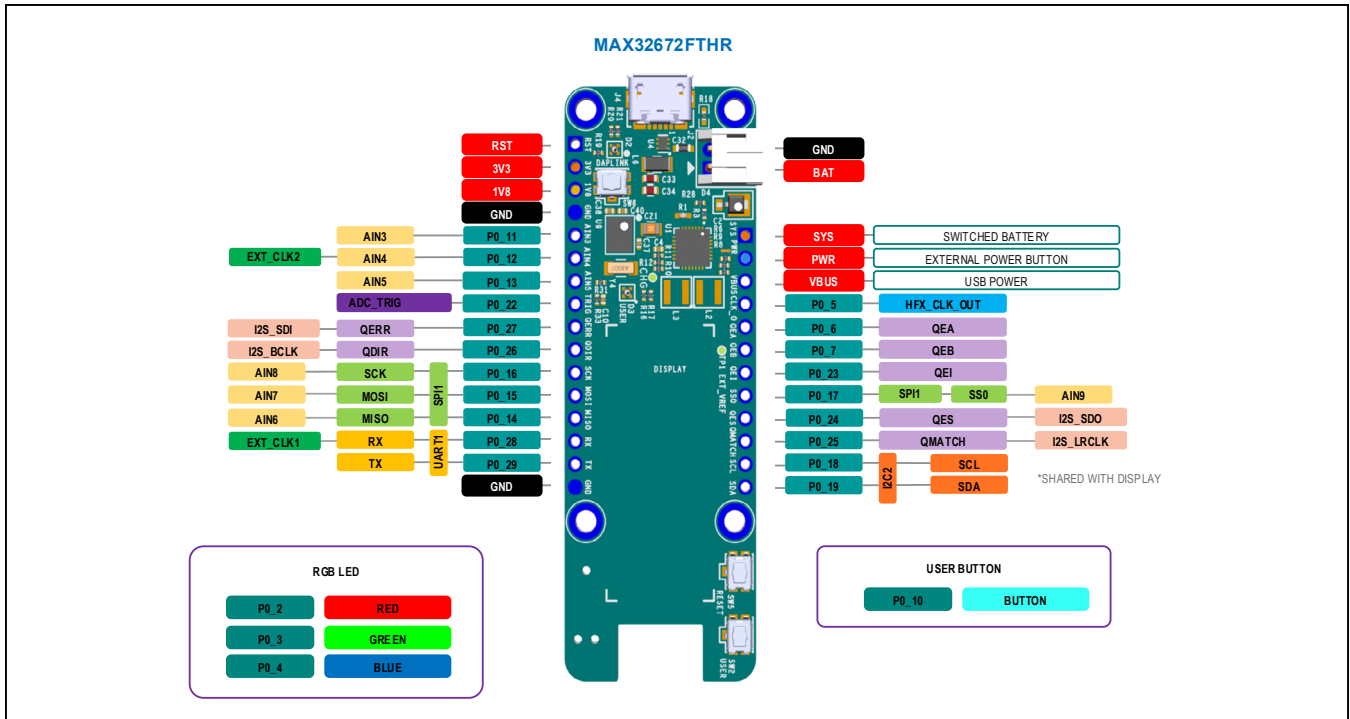


Figure 1. MAX32672FTHR Pinout Diagram

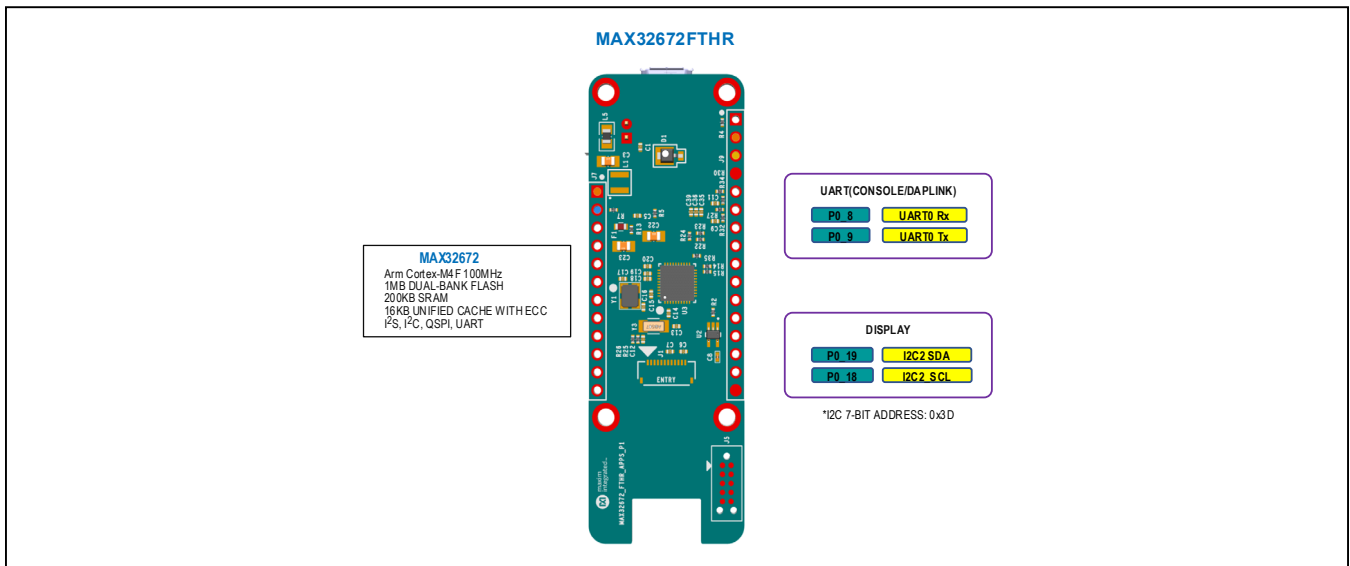


Figure 2. MAX32672FTHR Bottom-Side Components

**Expansion Headers**

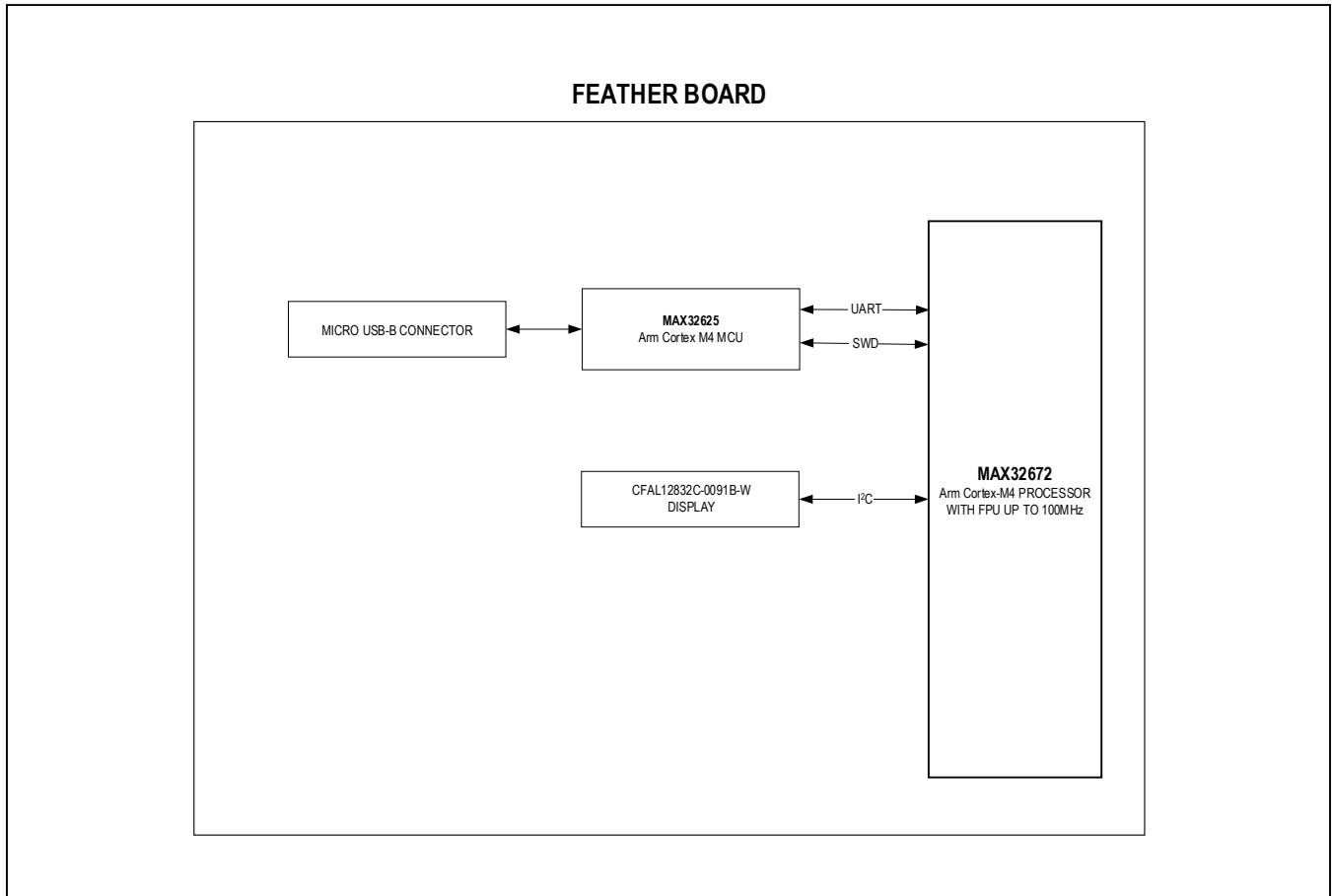
**Table 1. J9 Pinout**

PIN	NAME	DESCRIPTION
1	RST	Master Reset Signal
2	3V3	3.3V Output. Typically used to provide 3.3V to peripherals connected to the expansion headers.
3	1V8	1.8V Output. Typically used to provide 1.8V to peripherals connected to the expansion headers.
4	GND	Ground
5	P0_11	GPIO or Analog Input (AIN3 channel)
6	P0_12	GPIO or Analog Input (AIN4 channel)
7	P0_13	GPIO or Analog Input (AIN5 channel)
8	P0_22	GPIO or ADC_TRIG signal
9	P0_27	GPIO or QERR signal
10	P0_26	GPIO or QDIR signal
11	P0_16	GPIO or SPI1 clock signal
12	P0_15	GPIO or SPI1 MOSI signal
13	P0_14	GPIO or SPI1 MISO signal
14	P0_28	GPIO or UART1 Rx signal
15	P0_29	GPIO or UART1 Tx signal
16	GND	Ground

**Table 2. J7 Pinout**

PIN	NAME	DESCRIPTION
1	SYS	SYS Switched Connection to the Battery. This is the primary system power supply and automatically switches between the battery voltage and the USB supply when available.
2	PWR	In battery-powered mode, turns off the PMIC if shorted to ground.
3	VBUS	USB VBUS Signal. This can be used as a 5V supply when connected to USB. This pin can also be used as an input to power the board.
4	P0_5	GPIO or HFX_CLK_OUT signal
5	P0_6	GPIO or QEA signal
6	P0_7	GPIO or QEB signal
7	P0_23	GPIO or QEI signal
8	P0_17	GPIO or SPI1 slave select signal
9	P0_24	GPIO or QES signal
10	P0_25	GPIO or QMATCH signal
11	P0_18	GPIO or I2C2 SCL signal
12	P0_19	GPIO or I2C2 SDA signal

**MAX32672FTHR Application Platform Diagram**



**Ordering Information**

PART	TYPE
MAX32672FTHR#	Application Platform

#Denotes RoHS compliant.

**MAX32672FTHR Application Platform Bill of Materials**

ITEM	REF_DES	DNI/ DNP	QTY	MFG PART #	MANUFACTURER	VALUE	DESCRIPTION
1	C1, C4- C6, C15	—	5	ZRB15XR61A475ME01	MURATA	4.7 $\mu$ F	CAP
2	C2	—	1	GRM033R61A225KE47	MURATA	2.2 $\mu$ F	CAP
3	C3, C21-C23	—	4	CL21B106KOQNNN	SAMSUNG	10 $\mu$ F	CAP
4	C7, C14, C19, C20, C35-C40	—	10	C0402C105K8PAC	KEMET	1 $\mu$ F	CAP
5	C8	—	1	GRM033C81E104KE14	MURATA	0.1 $\mu$ F	CAP
6	C16, C17	—	2	GCQ1555C1H190JB01	MURATA	19pF	CAP
7	C18	—	1	C0402C472K5RAC	KEMET	4700pF	CAP
8	C32, C34	—	2	GMK107BJ105KA	TAIYO YUDEN	1 $\mu$ F	CAP
9	C33	—	1	C1608X8R1E104K080AA	TDK	0.1 $\mu$ F	CAP
10	D1, D4	—	2	STPS120M	ST MICROELECTRONICS	STPS120M	DIODE
11	D2, D3	—	2	IN-B101FCH	INOLUX	IN-B101FCH	DIODE
12	F1	—	1	0494.500NRHF	LITTELFUSE	0.5A	FUSE
13	J2	—	1	S2B-PH-K-S(LF)(SN)	JST MANUFACTURING	S2B-PH-K-S(LF) (SN)	CONNECTOR
14	J4	—	1	47346-0001	MOLEX	47346-0001	CONNECTOR
15	L1-L3	—	3	NRH3012T4R7MN	TAIYO YUDEN	4.7 $\mu$ H	INDUCTOR
16	L5	—	1	BLM21PG221SN1	MURATA	220 $\Omega$	INDUCTOR
17	L6	—	1	HZ1206C202R-10	LAIRD TECHNOLOGIES	2000 $\Omega$	INDUCTOR
18	R1-R3, R13, R35	—	5	ERJ-2RKF1002	PANASONIC	10k $\Omega$	RES
19	R4, R20, R23	—	3	ERJ-2GEJ102	PANASONIC	1k $\Omega$	RES
20	R5	—	1	CRCW040215K0FK	VISHAY DALE	15k $\Omega$	RES
21	R6	—	1	RR0510P-203-D	SUSUMU CO LTD.	20k $\Omega$	RES
22	R7, R9, R12	—	3	CRCW0402100KFK	VISHAY DALE	100k $\Omega$	RES
23	R8	—	1	ERJ-2RKF8062	PANASONIC	80.6k $\Omega$	RES
24	R10	—	1	ERJ-2RKF4703	PANASONIC	470k $\Omega$	RES
25	R11	—	1	CRCW0402232KFK	VISHAY DALE	232k $\Omega$	RES
26	R14-R17, R32-R34	—	7	ERJ-2GE0R00	PANASONIC	0 $\Omega$	RES

**MAX32672FTHR Application Platform Bill of Materials (continued)**

ITEM	REF_DES	DNI/ DNP	QTY	MFG PART #	MANUFACTURER	VALUE	DESCRIPTION
27	R18	—	1	ERJ-2RKF1004	PANASONIC	1MΩ	RES
28	R19, R22	—	2	RC0402FR-072K2L	YAGEO	2.2kΩ	RES
29	R21, R24	—	2	ERJ-2RKF5100	PANASONIC	510Ω	RES
30	R25, R26	—	2	CRCW04023K30FK	VISHAY DALE	3.3kΩ	RES
31	R28	—	1	CRCW0402768KFK	VISHAY DALE	768kΩ	RES
32	SW2, SW5, SW6	—	3	EVP-AA102K	PANASONIC	EVP-AA102K	SWITCH
33	U1	—	1	MAX8819AETI+	MAXIM	MAX8819AETI+	IC
34	U2	—	1	SN74LVC1G07DCK	TEXAS INSTRUMENTS	SN74LVC1G07DCK	IC
35	U3	—	1	MAX32672GTL+	MAXIM	MAX32672GTL+	EVKIT PART - IC
36	U4	—	1	MAX13202EALT+	MAXIM	MAX13202EALT+	IC
37	U9	—	1	MAX32625IWY+	MAXIM	MAX32625IWY+	IC
38	Y1	—	1	SXT32419DD27-24.576M	SUNTSU ELECTRONICS INC	24.576MHZ	CRYSTAL
39	Y3, Y4	—	2	ABS07-32.768KHZ-6-T	ABRACON	32.768kHz	CRYSTAL
40	PCB	—	1	MAX32672_FTHR_ APPS_A	MAXIM	PCB	PCB:MAX32672 _FTHR_APPS_ A
41	J1	—	1	FFC2B28-12-G	GLOBAL CONNECTOR TECH		CONNECTOR
42	J7	DNI	1	PBC12SAAN	SULLINS ELECTRONICS CORP.	PBC12SAAN	CONNECTOR
43	J9	DNI	1	PBC16SAAN	SULLINS ELECTRONICS CORP.	PBC16SAAN	CONNECTOR
44	J1	DNI	1	CFAL12832C-0091B-W	CRYSTALFONTZ	CFAL12832C- 0091B-W	MODULE
45	C9-C13	DNP	0	GRM1555C1H6R0DA01	MURATA	6pF	CAP
46	J5	DNP	0	TC2050-IDC-NL	TAG-CONNECT	TC2050-IDC-NL	CONNECTOR
47	R27, R30, R31	DNP	0	CRCW0402499RFK	VISHAY DALE	499Ω	RES

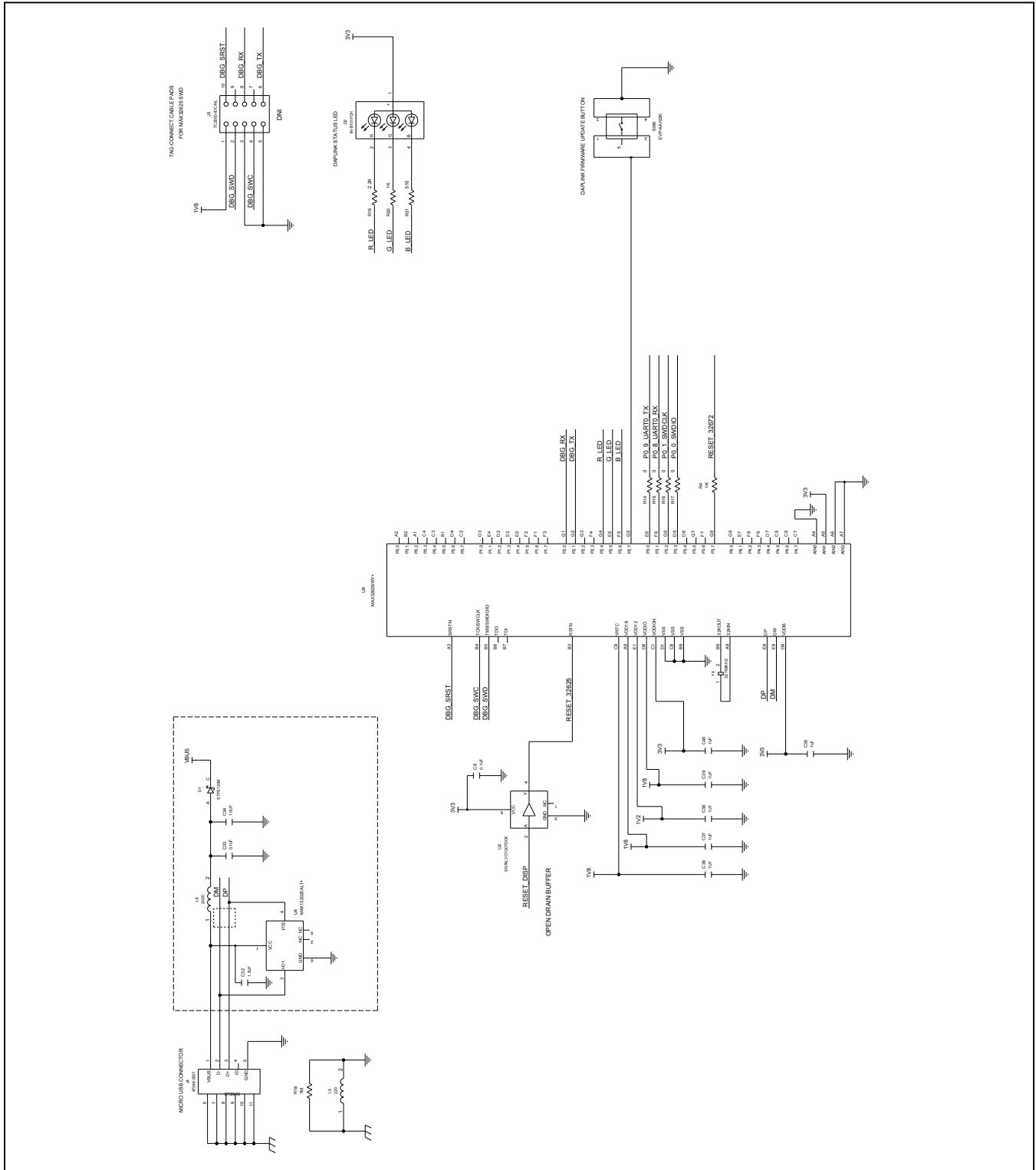




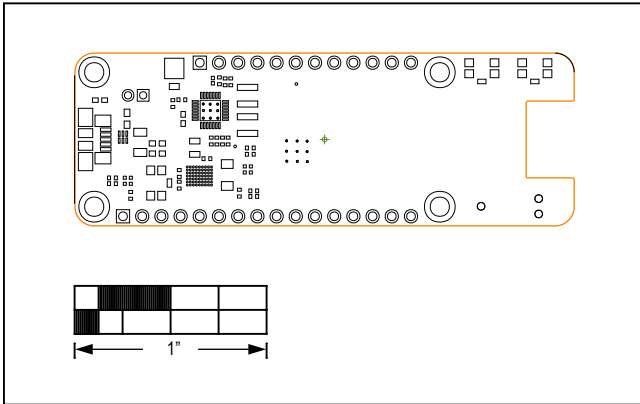




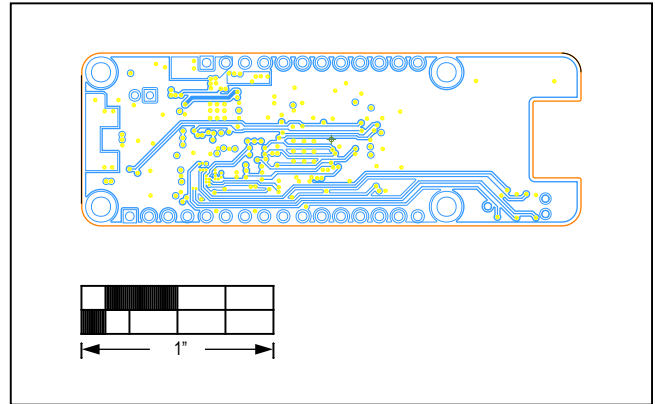
## MAX32672FTHR Application Platform Schematics (continued)



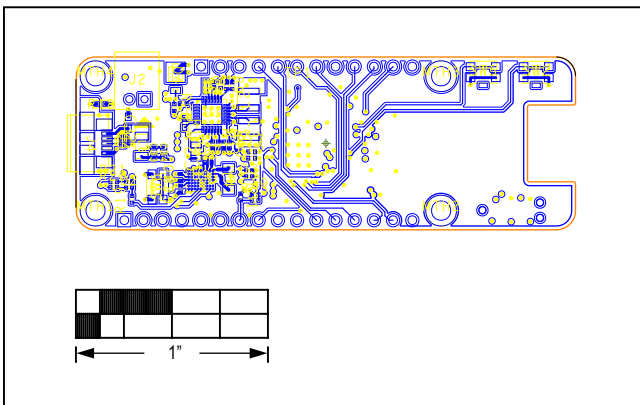
**MAX32672FTHR Application Platform PCB Layouts**



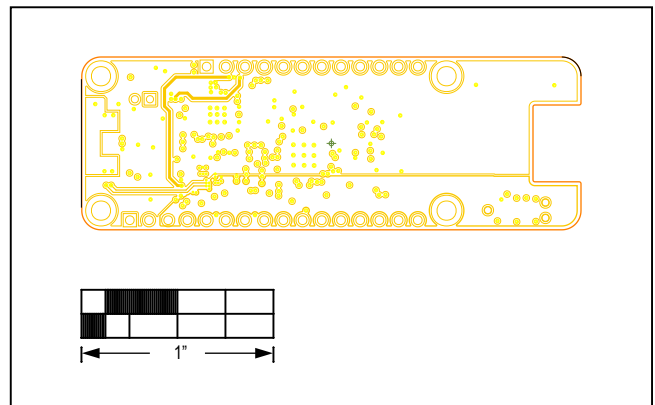
MAX32672FTHR Application Platform PCB Layout—Mask Top



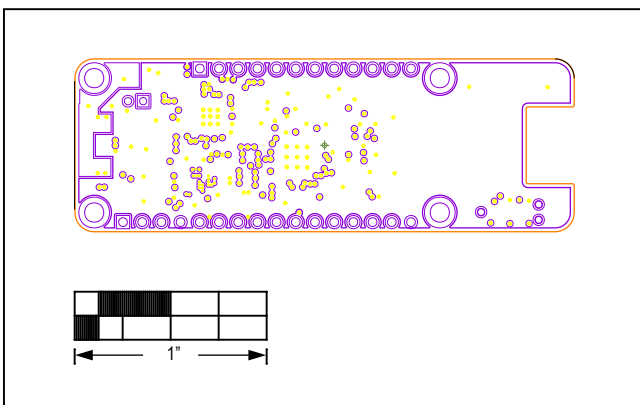
MAX32672FTHR Application Platform PCB Layout—Layer 3 – Signal



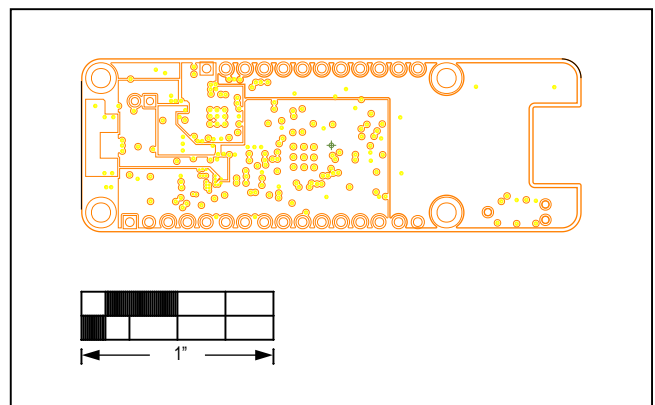
MAX32672FTHR Application Platform PCB Layout—Top



MAX32672FTHR Application Platform PCB Layout—Layer 4 – Signal



MAX32672FTHR Application Platform PCB Layout—Layer 2 – Ground

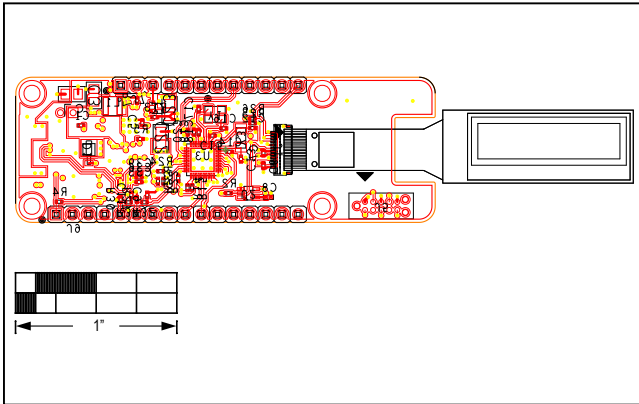


MAX32672FTHR Application Platform PCB Layout—Layer 5 – Power

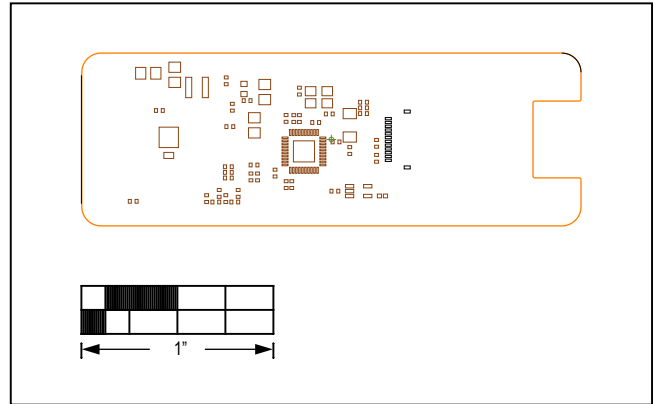
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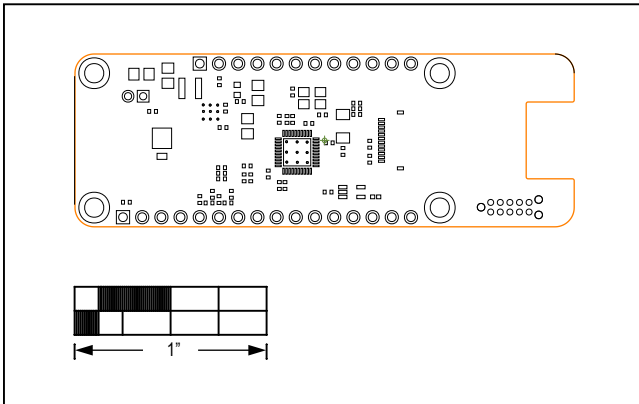
## MAX32672FTHR Application Platform PCB Layouts (continued)



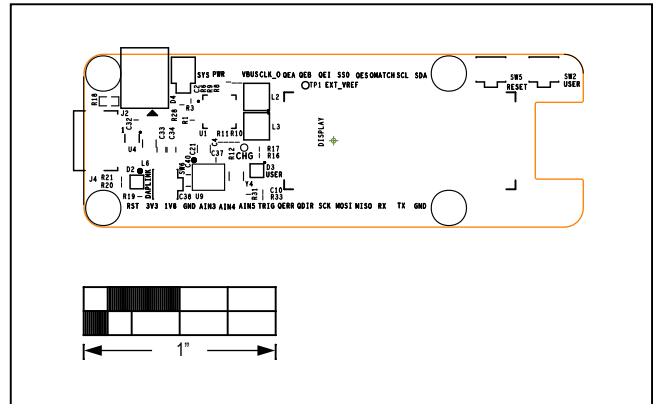
MAX32672FTHR Application Platform PCB Layout—Bottom



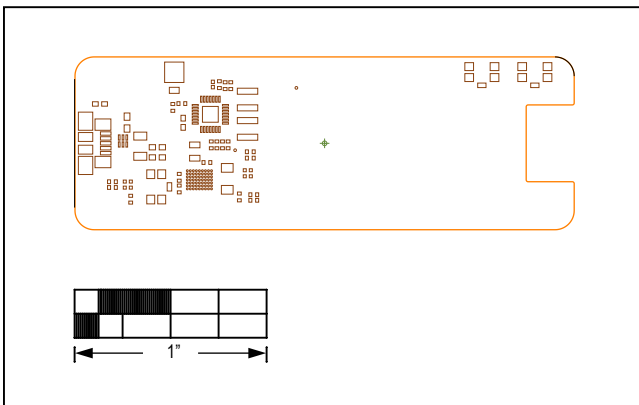
MAX32672FTHR Application Platform PCB Layout—Paste Bottom



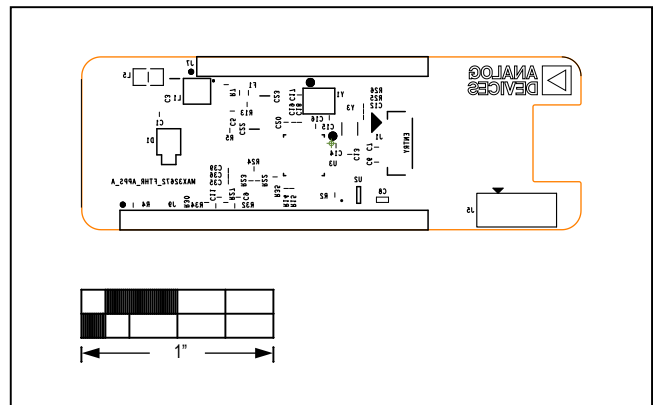
MAX32672FTHR Application Platform PCB Layout—Mask Bottom



MAX32672FTHR Application Platform PCB Layout—Silk Top



MAX32672FTHR Application Platform PCB Layout—Paste Top



MAX32672FTHR Application Platform PCB Layout—Silk Bottom

**Revision History**

<b>REVISION NUMBER</b>	<b>REVISION DATE</b>	<b>DESCRIPTION</b>	<b>PAGES CHANGED</b>
0	1/22	Initial release	—

