

## General Description

The MAX14871 evaluation kit (EV kit) consists of a MAX14871 evaluation board. The EV kit is a fully assembled and tested circuit board that evaluates the MAX14871 full-bridge DC motor driver.

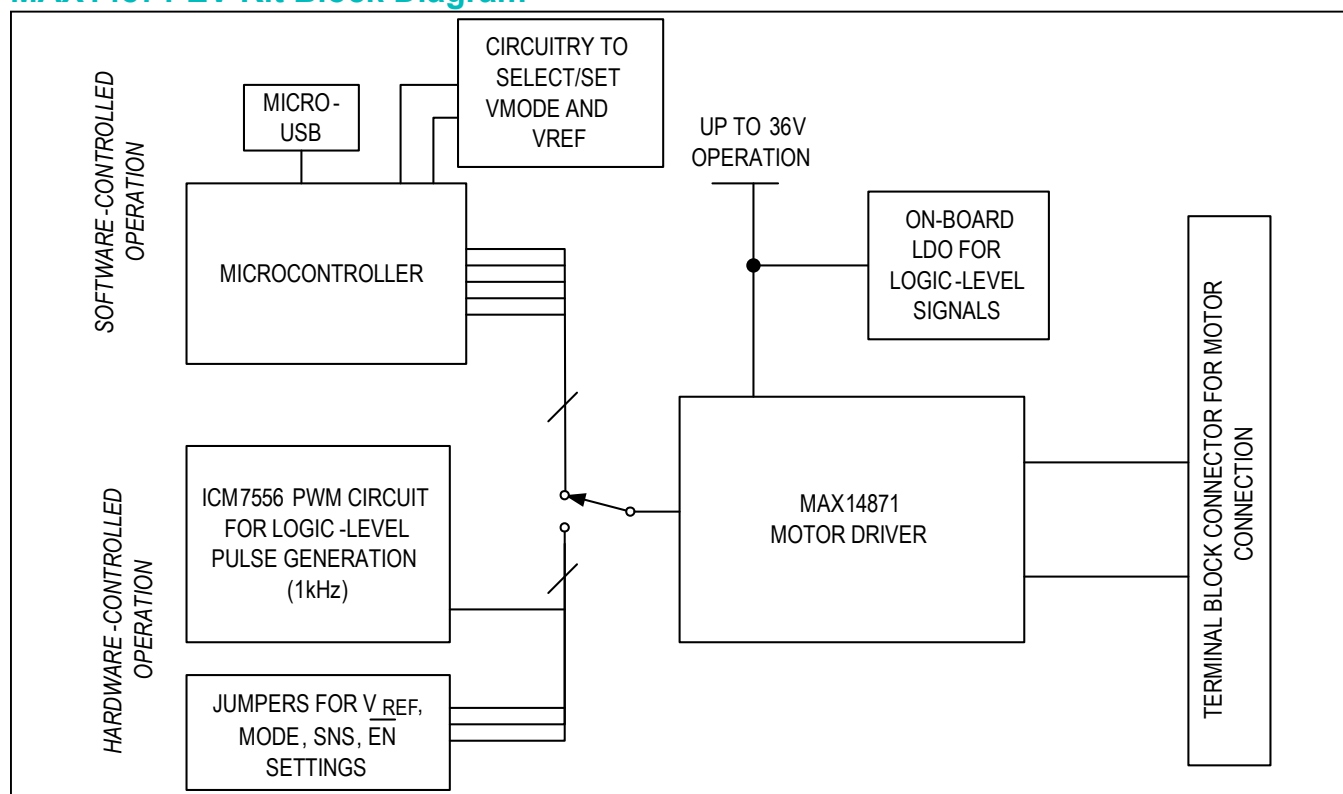
The EV kit is designed to work as either a stand-alone board or with a software interface, demonstrating all of the major features of the device.

## Features

- Operates From a Wide 4.5V to 36V Supply
- Standalone or Software-Controlled Operation
- Proven PCB Layout
- Fully Assembled and Tested

*Ordering Information appears at end of data sheet.*

## MAX14871 EV Kit Block Diagram



## Quick Start

### Recommended Equipment

- MAX14871 EV kit
- User-supplied Windows XP®, Windows Vista®, or Windows 7 PC with a spare USB port.
- 24V, 1A power supply
- DC brushed motor

### Procedure

The EV kit is fully assembled and tested. Follow the steps below to verify board operation before exercising the full features of the device:

- 1) Verify that all jumpers are in their default positions, as shown in [Table 1](#).
- 2) Connect the 24V DC power supply on the VCC and GND connectors on the EV kit board.
- 3) See application note Using the MAX14871EVKIT with software to configure the board for software operation.
- 4) Connect the DC brushed motor to the M1 and M2 terminals in the J12 connector.
- 5) Turn on the 24V power supply.

## Detailed Description of Hardware

The MAX14871 EV kit is a fully tested circuit board demonstrating the capabilities of the MAX14871 motor driver.

### Stand-Alone Operation

Remove all of the shunts on the P2 header for stand-alone operation. On-board LDOs generate logic rails and headers are included for device configuration in stand-alone mode.

### On-Board LDO

The MAX15006 (U5) on-board LDO generates 3.3V for logic signals and for powering the fault LED. The 3.3V LDO also powers the on-board ICM7556 PWM signal generator.

### On-Board PWM Generator

The ICM7556 (U2) general-purpose timer circuit is available to generate PWM signals for switching either the PWM or DIR inputs. Adjust the R1 potentiometer to change the duty cycle of the output signal.

The EV kit comes with the PWM frequency set up to 1kHz but can be adjusted up to 10kHz by changing the C3 capacitor. Set the PWM frequency using the following equation:

$$f_{SW} = 1.46 / [(R_{29} + 2 \times R_{32}) \times C_3]$$

### Motor Operation

The MAX14871 is capable of operating in any one of three current regulation modes: fast decay, slow decay, or 25% ripple current mode. To set the mode, apply a voltage to VMODE and VREF ([Table 2](#)).

#### VREF

Set the VREF voltage to limit the motor current using the following equation:

$$V_{REF} = I_{MOTOR} \times A_V \times R_{SENSE}$$

For easy evaluation, J6 can be used to set the VREF voltage to 3.3V or 0V. Connect 1-2 on J6 to set VREF to 3.3V. Connect 2-3 on J6 to set VREF to 0V.

#### MODE

The J7 jumper can be used to set the MODE voltage high (3.3V) or low (0V). For 25% ripple mode, however, the MODE voltage must be between 0.5V and 1V. Apply an external voltage to the MODE test point, or connect a resistor divider on the R3 and R5 resistor pads to set the MODE voltage for this mode of operation.

### Fault Indicator LED

The FAULT output is connected to the 3.3V logic supply through R4. LED1 turns on during a fault condition.

Table 1. Jumper Descriptions

| JUMPER | SHUNT POSITON | DESCRIPTION                                                                                      |
|--------|---------------|--------------------------------------------------------------------------------------------------|
| J1     | 1-2           | PWM is high.                                                                                     |
|        | 2-3           | PWM is low.                                                                                      |
| J2     | 1-2           | DIR is high.                                                                                     |
|        | 2-3           | DIR is low.                                                                                      |
| J3     | 1-2*          | SNS is connected to COM.                                                                         |
|        | 2-3           | SNS is connected to GND.                                                                         |
| J4     | 1-2           | Output of the on-board pulse generator circuit is connected to PWM.                              |
|        | 2-3           | Output of the on-board pulse generator circuit is connected to DIR.                              |
| J5     | 1-2           | $\overline{\text{EN}}$ is high.                                                                  |
|        | 2-3           | $\overline{\text{EN}}$ is low.                                                                   |
| J6     | 1-2           | VREF is connected to 3.3V.                                                                       |
|        | 2-3           | VREF is connected to 0V.                                                                         |
| J7     | 1-2           | MODE is connected to 3.3V.                                                                       |
|        | 2-3           | MODE is connected to 0V.                                                                         |
|        | Open*         | V <sub>MODE</sub> is set by the software or by the R3 and R5 voltage divider. R3 and R5 are DNI. |
| J8     | Open*         | COM is not shorted to ground.                                                                    |
|        | Closed        | COM is shorted to ground.                                                                        |
| J9     | Open*         | This jumper is used to program the on-board microcontroller. Do not shunt this jumper.           |
|        | Closed        |                                                                                                  |
| J10    | Open*         | This jumper is used to program the on-board microcontroller. Do not shunt this jumper.           |
|        | Closed        |                                                                                                  |
| J11    | Open*         | This jumper is used to program the on-board microcontroller. Do not shunt this jumper.           |
|        | Closed        |                                                                                                  |
| J13    | 1-2*          | VREF is set by the on-board microcontroller circuitry.                                           |
|        | 3-4*          | MODE is set by the on-board microcontroller circuitry.                                           |
|        | 5-6*          | FAULT is connected to the microcontroller.                                                       |
|        | 7-8*          | PWM signal is generated by the on-board microcontroller.                                         |
|        | 9-10*         | DIR signal is generated by the on-board microcontroller.                                         |
|        | 11-12*        | $\overline{\text{EN}}$ signal is generated by the on-board microcontroller.                      |

\*Default position.

Table 2. Current Regulation Logic

| INPUTS                 |                  |                                             |                        | OPERATING MODE                                                                                                              |
|------------------------|------------------|---------------------------------------------|------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| $\overline{\text{EN}}$ | $V_{\text{REF}}$ | MODE                                        | $V_{\text{SNS}}$       |                                                                                                                             |
| 0                      | < 0.2V           | X                                           | < 0.1V                 | Normal PWM Operation. No current regulation.                                                                                |
| 0                      | < 0.2V           | $V_{\text{MODE}} < 0.5\text{V}$             | > 0.1V                 | Current regulation based on 15 $\mu\text{s}$ (typ) fixed off-time control with fast decay using internal $V_{\text{REF}}$ . |
| 0                      | < 0.2V           | $0.5\text{V} < V_{\text{MODE}} < 1\text{V}$ | > 0.1V                 | Current regulation based on 25% current ripple fast decay using internal $V_{\text{REF}}$ .                                 |
| 0                      | < 0.2V           | $V_{\text{MODE}} > 1.5\text{V}$             | > 0.1V                 | Current regulation based on 15 $\mu\text{s}$ (typ) fixed off-time control with slow decay using internal $V_{\text{REF}}$ . |
| 0                      | > 0.4V           | X                                           | < $V_{\text{VREF}}/10$ | Normal PWM Operation. No current regulation.                                                                                |
| 0                      | > 0.4V           | $V_{\text{MODE}} < 0.5\text{V}$             | > $V_{\text{VREF}}/10$ | Current regulation based on fixed TOFF-time control with fast decay using external $V_{\text{REF}}$ .                       |
| 0                      | > 0.4V           | $0.5\text{V} < V_{\text{MODE}} < 1\text{V}$ | > $V_{\text{VREF}}/10$ | Current regulation based on 25% current ripple fast decay using external $V_{\text{REF}}$ .                                 |
| 0                      | > 0.4V           | $V_{\text{MODE}} > 1.5\text{V}$             | > $V_{\text{VREF}}/10$ | Current regulation based on fixed TOFF-time control with slow decay using external $V_{\text{REF}}$ .                       |

X = Don't care

## Ordering Information

| PART           | TYPE   |
|----------------|--------|
| MAX14871EVKIT# | EV Kit |

#Denotes RoHS compliant.

## Component Information

See the following links for component information, PCB files, and schematics:

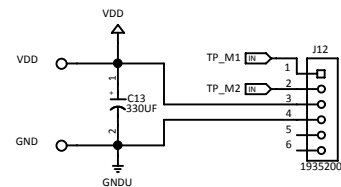
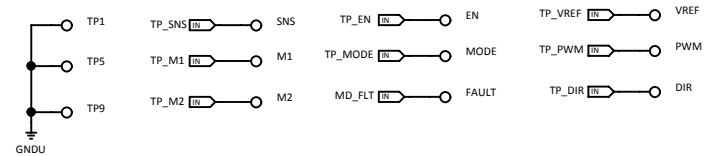
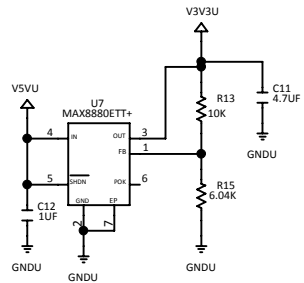
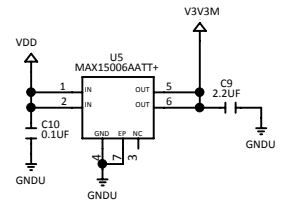
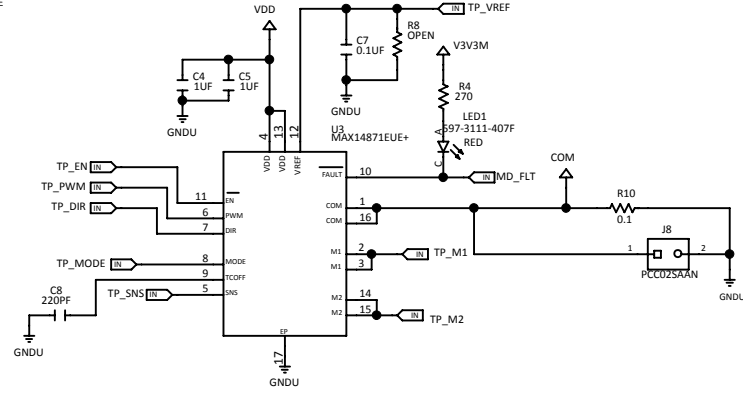
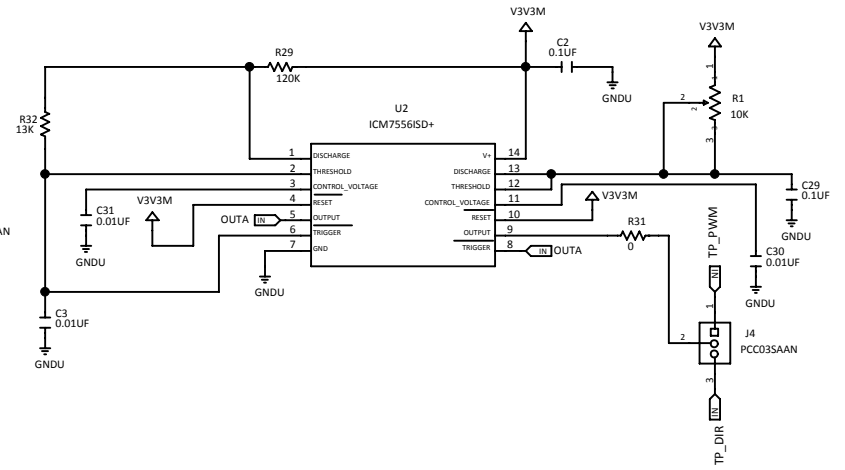
- [MAX14871 EV BOM](#)
- [MAX14871 EV Schematic](#)
- [MAX14871 EV PCB](#)

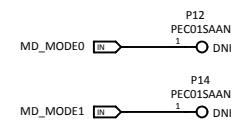
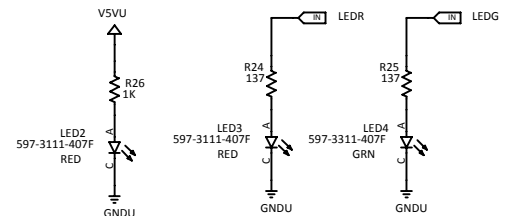
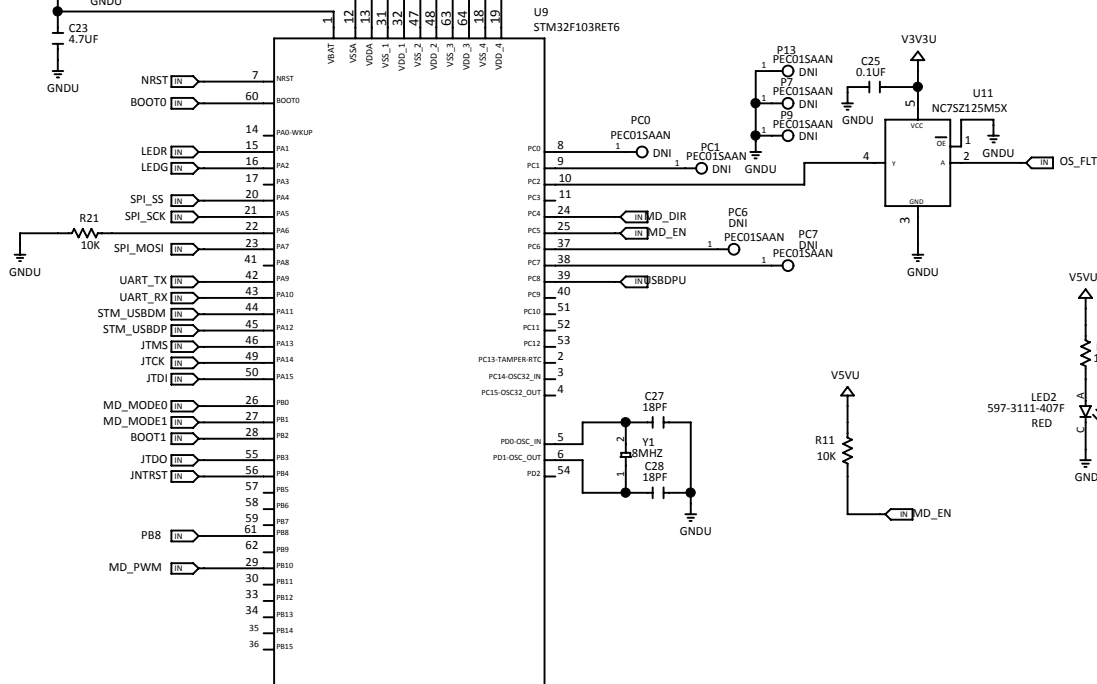
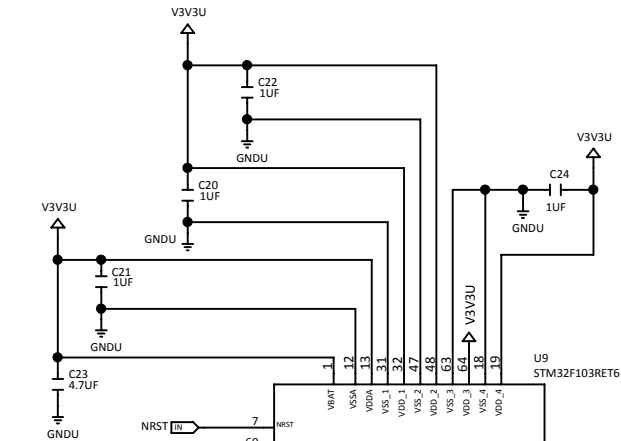
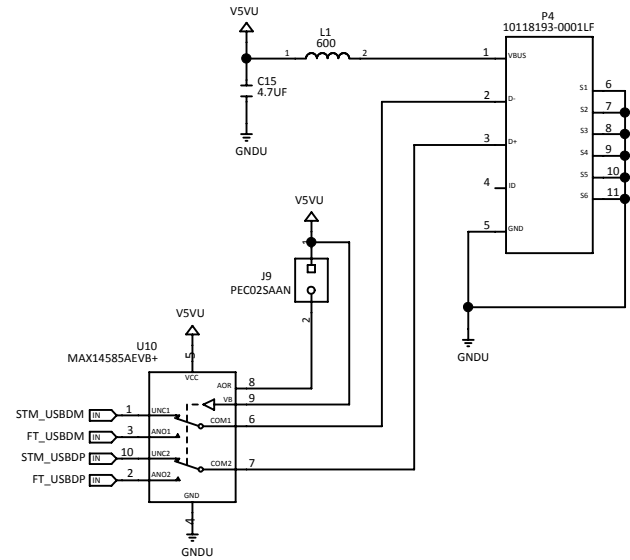
## Revision History

| REVISION<br>NUMBER | REVISION<br>DATE | DESCRIPTION     | PAGES<br>CHANGED |
|--------------------|------------------|-----------------|------------------|
| 0                  | 6/15             | Initial release | —                |

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](http://www.maximintegrated.com).

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HARDWARE NAME: MAX14871\_EVKIT\_A

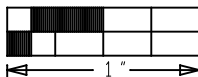
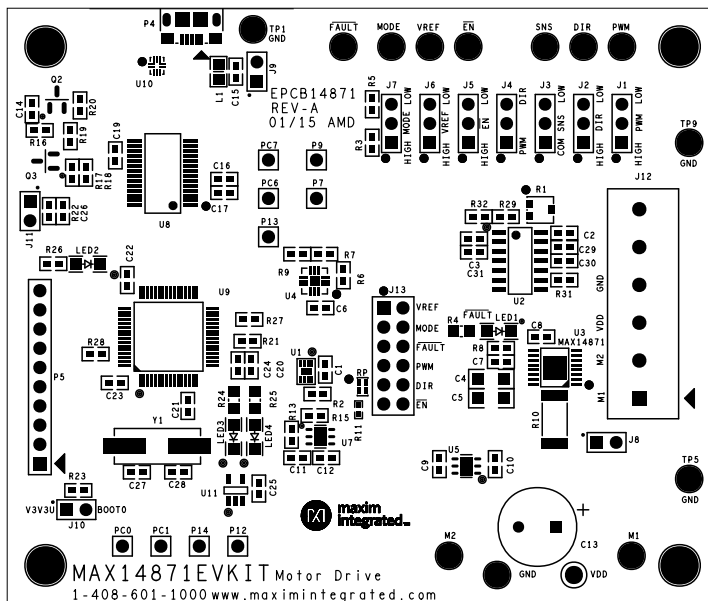
HARDWARE NUMBER: EPCB14871

ENGINEER:

DESIGNER:

DATE: 12/16/2014

ODB++/GERBER: SILK\_TOP





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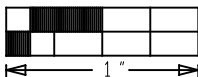
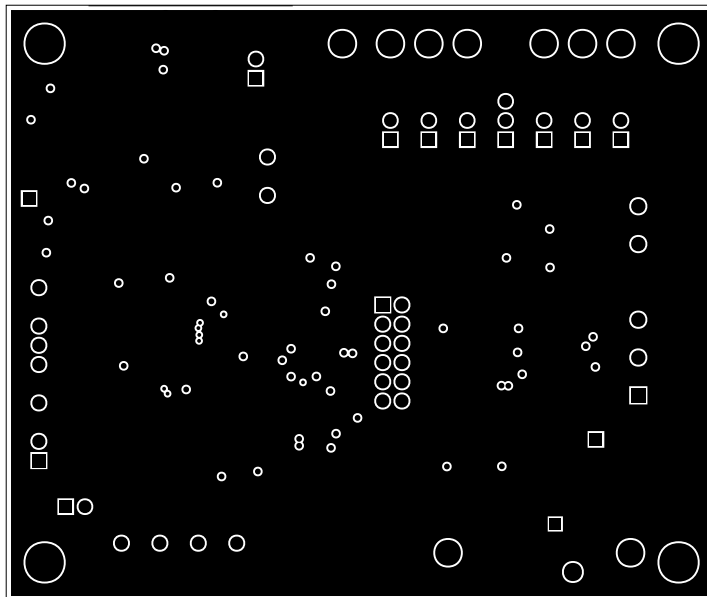
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ENGINEER:

DESIGNER:

DATE: 12/16/2014

ODB++/GERBER: LAYER2





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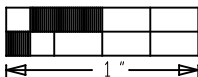
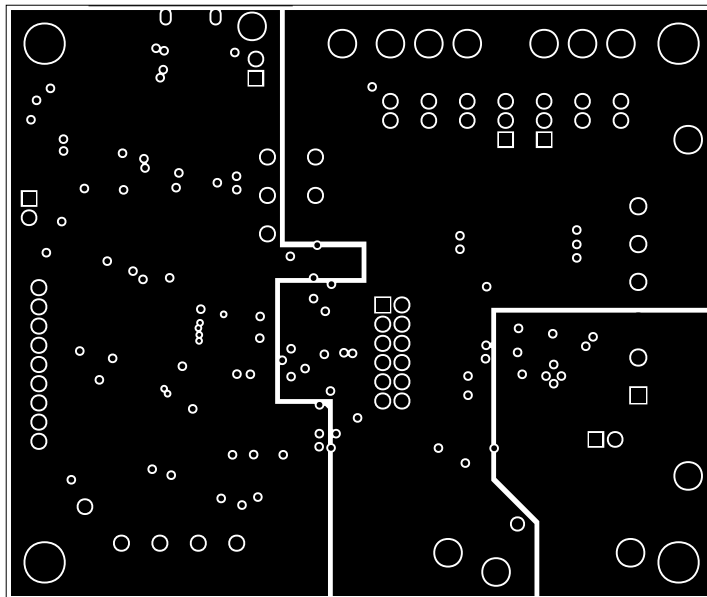
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ENGINEER:

DESIGNER:

DATE: 12/16/2014

ODB++/GERBER: LAYER 3





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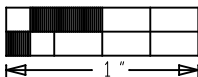
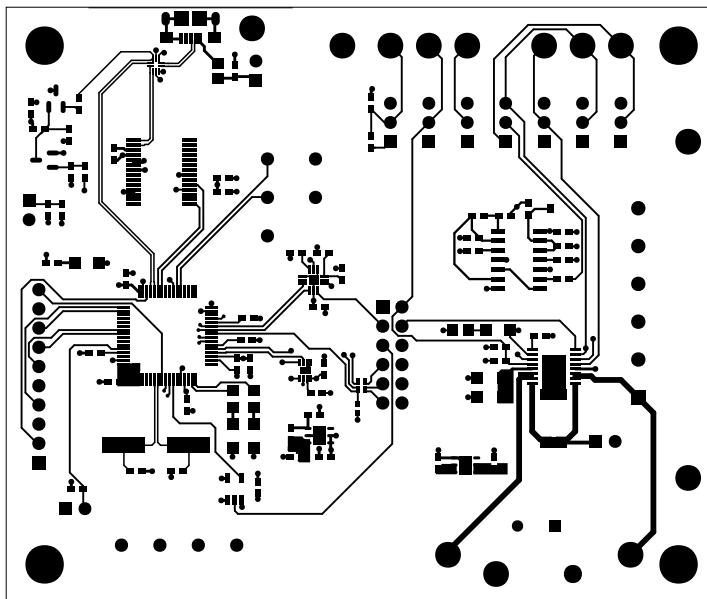
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ENGINEER:

DESIGNER:

DATE: 12/16/2014

ODB++/GERBER: TOP





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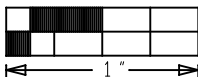
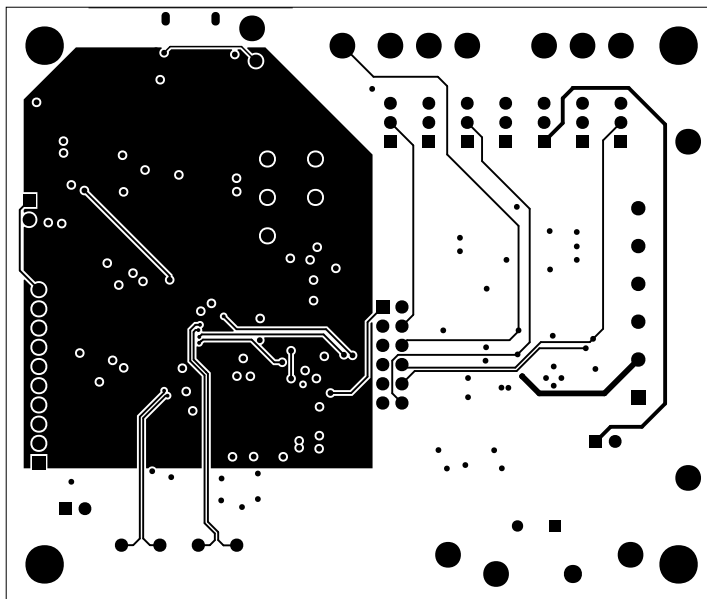
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ENGINEER:

DESIGNER:

DATE: 12/16/2014

ODB++/GERBER: BOTTOM



# Bill of Materials

DATE: 01/08/2015

DESIGN: max14871\_evkit\_a

Revision\_Type : PRODUCTION

| ITEM | QTY | REF DES                              | MFG PART #     | MANUFACTURER              | VALUE     | DESCRIPTION                                                                                                                                                                         |
|------|-----|--------------------------------------|----------------|---------------------------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | 8   | C1,C2,C6,C7,C19,C25,C26,C29          |                |                           | 0.1UF     | CAPACITOR; SMT (0603); CERAMIC CHIP; 0.1UF; 16V; TOL=10%; MODEL=; TG=-55 DEGC TO +125 DEGC; TC=X7R; NOT RECOMMENDED FOR NEW DESIGN USE 20-000u1-01                                  |
| 2    | 3   | C3,C30,C31                           |                |                           | 0.01UF    | CAPACITOR; SMT (0603); CERAMIC CHIP; 0.01UF; 50V; TOL=5%; MODEL=X7R; TG=-55 DEGC TO +125 DEGC; TC=+/-                                                                               |
| 3    | 2   | C4,C5                                |                |                           | 1UF       | CAPACITOR; SMT (1206); CERAMIC CHIP; 1UF; 50V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R                                                                                            |
| 4    | 1   | C8                                   |                |                           | 220PF     | CAPACITOR; SMT (0603); CERAMIC CHIP; 220PF; 50V; TOL=5%; MODEL=PPS; TG=-55 DEGC TO +85 DEGC; TC=+/-                                                                                 |
| 5    | 1   | C9                                   |                |                           | 2.2UF     | CAPACITOR; SMT (0603); CERAMIC CHIP; 2.2UF; 25V; TOL=10%; MODEL=; TG=-55 DEGC TO +85 DEGC; TC=X5R                                                                                   |
| 6    | 1   | C10                                  |                |                           | 0.1UF     | CAPACITOR; SMT (0603); CERAMIC CHIP; 0.1UF; 50V; TOL=10%; MODEL=C SERIES; TG=-55 DEGC TO +85 DEGC; TC=X5R                                                                           |
| 7    | 4   | C11,C15,C17,C23                      |                |                           | 4.7UF     | CAPACITOR; SMT; 0603; CERAMIC; 4.7uF; 10V; 10%; X5R; 55degC to + 85degC; 0 +/-15% degC MAX.                                                                                         |
| 8    | 7   | C12,C14,C16,C20-C22,C24              |                |                           | 1UF       | CAPACITOR; SMT (0603); CERAMIC CHIP; 1UF; 25V; TOL=10%; MODEL=GRM SERIES; TG=-55 DEGC TO +125 DEGC; TC=X7R                                                                          |
| 9    | 1   | C13                                  |                |                           | 330UF     | CAPACITOR; THROUGH HOLE-RADIAL LEAD; ALUMINUM-ELECTROLYTIC; 330UF; 50V; TOL=20%; MODEL=EB SERIES; TG=-40 DEGC TO +105 DEGC                                                          |
| 10   | 2   | C27,C28                              |                |                           | 18PF      | CAPACITOR; SMT (0603); CERAMIC CHIP; 18PF; 50V; TOL=5%; MODEL=; TG=-55 DEGC TO +125 DEGC; TC=C0G                                                                                    |
| 11   | 9   | EN,M1,M2,DIR,PWM,SNS,MODE,VREF,FAULT | 5014           | KEYSTONE                  | N/A       | TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; YELLOW; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH; RECOMMENDED FOR BOARD THICKNESS=0.062IN; NOT FOR COLD TEST |
| 12   | 4   | GND,TP1,TP5,TP9                      | 5011           | KEYSTONE                  | N/A       | TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; BLACK; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH; RECOMMENDED FOR BOARD THICKNESS=0.062IN; NOT FOR COLD TEST  |
| 13   | 7   | J1-J7                                | PCC03SAAN      | SULLINS                   | PCC03SAAN | CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT THROUGH; 3PINS; -65 DEGC TO +125 DEGC                                                                                            |
| 14   | 1   | J8                                   | PCC02SAAN      | SULLINS                   | PCC02SAAN | CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT THROUGH; 2PINS; -65 DEGC TO +125 DEGC                                                                                            |
| 15   | 3   | J9-J11                               | PEC02SAAN      | SULLINS                   | PEC02SAAN | CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 2PINS; -65 DEGC TO +125 DEGC                                                                                                    |
| 16   | 1   | J12                                  | 1935200        | PHOENIX CONTACT           | 1935200   | CONNECTOR; FEMALE; THROUGH HOLE; GREEN TERMINAL BLOCK; STRAIGHT; 6PINS                                                                                                              |
| 17   | 1   | J13                                  | PEC06DAAN      | SULLINS ELECTRONICS CORP. | PEC06DAAN | CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 12PINS; -65 DEGC TO +125 DEGC                                                                                                   |
| 18   | 1   | L1                                   | BLM21AG601SN1D | MURATA                    | 600       | INDUCTOR; SMT (0805); FERRITE-BEAD; 600; TOL=+/-25%; 0.2A                                                                                                                           |

|    |    |                           |                 |                                     |                 |                                                                                                                         |
|----|----|---------------------------|-----------------|-------------------------------------|-----------------|-------------------------------------------------------------------------------------------------------------------------|
| 19 | 3  | LED1-LED3                 | 597-3111-407F   | DIALIGHT                            | 597-3111-407F   | DIODE; LED; SMT LED; RED; SMT (1206); PIV=4V; IF=0.03A                                                                  |
| 20 | 1  | LED4                      | 597-3311-407F   | DIALIGHT                            | 597-3311-407F   | DIODE; LED; STANDARD; GREEN; SMT (1206); PIV=2.1V; IF=0.02A                                                             |
| 21 | 1  | P4                        | 10118193-0001LF | FCI CONNECT                         | 10118193-0001LF | CONNECTOR; FEMALE; SMT; MICRO USB B TYPE RECEPTACLE; RIGHT ANGLE; 5PINS                                                 |
| 22 | 2  | Q2,Q3                     | MMBT3904        | N/A                                 | MMBT3904        | TRANSISTOR, NPN, SOT-23, PD=0.225W, IC=0.2A, VCEO=40V                                                                   |
| 23 | 1  | R1                        | PVZ3A103C01     | ?                                   | 10K             | RESISTOR; SMT J-LEAD; TRIMMER POTENTIOMETER; 1 TURN; 10K OHM; 30%; 500PPM; 0.1W; TADJ; CARBON FILM                      |
| 24 | 8  | R2,R7,R13,R21-R23,R27,R28 |                 |                                     | 10K             | RESISTOR; 0603; 10K OHM; 1%; 100PPM; 0.0125W; THICK FILM                                                                |
| 25 | 1  | R4                        |                 |                                     | 270             | RESISTOR; 0805, 270 OHM; 1%, 100PPM; 0.125W; THICK FILM                                                                 |
| 26 | 1  | R6                        |                 |                                     | 34K             | RESISTOR; 0603; 34K OHM; 1%; 100PPM; 0.10W; THICK FILM                                                                  |
| 27 | 2  | R9,R26                    |                 |                                     | 1K              | RESISTOR; 0603; 1K OHM; 1%; 100PPM; 0.10W; THICK FILM                                                                   |
| 28 | 1  | R10                       |                 |                                     | 0.1             | RESISTOR; 2512; 0.1 OHM; 1%; 75PPM; 3W; METAL FILM                                                                      |
| 29 | 1  | R11                       |                 |                                     | 10K             | RESISTOR; 0402; 10K; 1%; 100PPM; 0.0625W; THICK FILM                                                                    |
| 30 | 1  | R15                       |                 |                                     | 6.04K           | RESISTOR; 0603; 6.04K; 1%; 100PPM; 0.10W; THICK FILM                                                                    |
| 31 | 1  | R16                       |                 |                                     | 3.92K           | RESISTOR; 0603; 3.92K OHM; 0.1%, 25PPM; 0.10W; THICK FILM                                                               |
| 32 | 1  | R17                       |                 |                                     | 39.2K           | RESISTOR; 0603; 39.2K; 1%; 100PPM; 0.10W; THICK FILM                                                                    |
| 33 | 1  | R18                       |                 |                                     | 332             | RESISTOR; 0603; 332 OHM; 1%; 100PPM; 0.10W; THICK FILM                                                                  |
| 34 | 1  | R19                       |                 |                                     | 102K            | RESISTOR; 0603; 102K OHM; 1%; 100PPM; 0.10W; THICK FILM                                                                 |
| 35 | 1  | R20                       |                 |                                     | 1.5K            | RESISTOR; 0603; 1.5K; 1%; 100PPM; 0.10W; THICK FILM                                                                     |
| 36 | 2  | R24,R25                   |                 |                                     | 137             | RESISTOR; 0805; 137 OHM; 1%; 100PPM; 0.125W; THICK FILM                                                                 |
| 37 | 1  | R29                       |                 |                                     | 120K            | RESISTOR; 0603; 120K OHM; 1%; 100PPM; 0.10W; THICK FILM                                                                 |
| 38 | 1  | R31                       |                 |                                     | 0               | RESISTOR; 0603; 0 OHM; 5%; JUMPER; 0.10W; THICK FILM                                                                    |
| 39 | 1  | R32                       |                 |                                     | 13K             | RESISTOR; 0603; 13K OHMS; 1%; 100PPM; 0.1W; THICK FILM                                                                  |
| 40 | 1  | RP                        |                 |                                     | 1K              | RESISTOR; ARRAY; 0402; 1K OHM; 5%; 200PPM; 0.063W; THICK FILM                                                           |
| 41 | 10 | SU1-SU10                  | STC02SYAN       | SULLINS ELECTRONICS CORP.           | STC02SYAN       | TEST POINT; JUMPER; STR; TOTAL LENGTH=0.256IN; BLACK; INSULATION=PBT CONTACT=PHOSPHOR BRONZE; COPPER PLATED TIN OVERALL |
| 42 | 1  | U1                        | MAX5394LATA+    | MAXIM                               | MAX5394LATA+    | IC; DPOT; SINGLE; 256-TAP VOLATILE; SPI; LOW-VOLTAGE TAPER DIGITAL POTENTIOMETER; TDFN8-EP 2MMX2MM                      |
| 43 | 1  | U2                        | ICM7556ISD+     | MAXIM                               | ICM7556ISD+     | IC; TIMR; GENERAL PURPOSE TIMER; NSOIC14 150MIL                                                                         |
| 44 | 1  | U3                        | MAX14871EUE+    | MAXIM                               | MAX14871EUE+    | IC; DRV; 12V FULL BRIDGE DC MOTOR DRIVER; TSSOP16-EP                                                                    |
| 45 | 1  | U4                        | MAX4704EGC+     | MAXIM                               | MAX4704EGC+     | IC; AMUX; LOW-VOLTAGE; 600HMS; 4:1 ANALOG MULTIPLEXER IN QFN; QFN12-EP 3X3                                              |
| 46 | 1  | U5                        | MAX15006AATT+   | MAXIM                               | MAX15006AATT+   | IC; VREG; ULTRA-LOW QUIESCENT-CURRENT LINEAR REGULATOR; TDFN6-EP 3X3                                                    |
| 47 | 1  | U7                        | MAX8880ETT+     | MAXIM                               | MAX8880ETT+     | IC; VREG; 12V; ULTRA-LOW-IQ; LOW-DROPOUT LINEAR REGULATOR WITH POK; TDFN6-EP 3X3                                        |
| 48 | 1  | U8                        | FT232RL         | FUTURE TECHNOLOGY DEVICES INTL LTD. | FT232RL         | IC; INFC; USB UART INTERFACE; SSOP28                                                                                    |

|                 |     |                               |                        |                                 |               |                                                                                                                                                  |
|-----------------|-----|-------------------------------|------------------------|---------------------------------|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| 49              | 1   | U9                            | STM32F103RET6          | ST<br>MICROELECTR<br>ONICS      | STM32F103RET6 | IC; MMRY; HIGH-DENSITY PERFORMANCE LINE ARM-<br>BASED 32-BIT MCU WITH 512KB FLASH; 11 TIMERS; 3<br>ADC; 13 COMMUNICATION INTERFACE; LQFP64 10X10 |
| 50              | 1   | U10                           | MAX14585AEVB<br>+      | MAXIM                           | MAX14585AEVB+ | IC; ASW; HI-SPEED USB AND AUDIO SWITCHES WITH<br>NEGATIVE SIGNAL CAPABILITY AND HIGH-VOLATGE-<br>TOLERABLE VBUS DETECTION; UTQFN10 1.4X1.8       |
| 51              | 1   | U11                           | NC7SZ125M5X            | FAIRCHILD<br>SEMICONDUCT<br>OR  | NC7SZ125M5X   | IIC; BUF; TINYLOGIC UHS BUFFER WITH THREE-STATE<br>OUTPUT; SOT23-5                                                                               |
| 52              | 1   | VDD                           | 5010                   | ?                               | N/A           | TESTPOINT WITH 1.80MM HOLE DIA, RED,<br>MULTIPURPOSE; NOT FOR COLD TEST                                                                          |
| 53              | 1   | Y1                            | HCM49-<br>8.000MABJ-UT | CITIZEN                         | 8MHZ          | CRYSTAL; SMT ; AT-CUT CRYSTAL UNIT; 18PF; 8MHZ; +/-<br>30PPM; +/-30PPM                                                                           |
| 54              | 1   |                               | EPCB14871              | MAXIM                           | PCB           | PCB: EPCB14871                                                                                                                                   |
| TOTAL           | 114 |                               |                        |                                 |               |                                                                                                                                                  |
|                 |     |                               |                        |                                 |               |                                                                                                                                                  |
| NOT INSERT(DNI) |     |                               |                        |                                 |               |                                                                                                                                                  |
| ITEM            | QTY | REF DES                       | MFG PART #             | MANUFACTUR<br>ER                | VALUE         | DESCRIPTION                                                                                                                                      |
| 1               | 1   | P5                            | PEC10SAAN              | SULLINS<br>ELECTRONICS<br>CORP. | PEC10SAAN     | CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY;<br>STRAIGHT; 10PINS                                                                                    |
| 2               | 9   | P7,P9,P12-P14,PC0,PC1,PC6,PC7 | PEC01SAAN              | SULLINS<br>ELECTRONICS<br>CORP  | PEC01SAAN     | CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY;<br>STRAIGHT; 1PIN                                                                                      |
| 3               | 3   | R3,R5,R8                      | N/A                    | N/A                             | OPEN          | PACKAGE OUTLINE 0603 RESISTOR - EVKIT                                                                                                            |
| TOTAL           | 13  |                               |                        |                                 |               |                                                                                                                                                  |