General Description

The MAX14838 evaluation kit (EV kit) is a fully assembled and tested circuit board that evaluates the MAX14838 pin-configurable industrial sensor output driver.

The MAX14838 EV kit may also be used to evaluate the MAX14839.

Features

- Operates from a Wide 4.75V to 34V Supply
- Standalone Operation
- Proven PCB Layout
- Fully Assembled and Tested

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

Quick Start

Recommended Equipment

- MAX14838 EV kit
- 24V, 1A Power Supply
- Mulimeter or voltmeter
- Function/signal generator
- Oscilloscope

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 to VCC and GND test points on the EV kit board.
3) Connect the multimeter to the VLDO and GND test points on the EV kit board.
4) Turn on the power supply.
5) Verify that the mulitmeter reads 5V on the VLDO pin.
5) Set the function/signal generator to generate a 0-3V 1kHz signal.
5) Remove the J1 jumper.
6) Connect the function/signal generator to the DIN test point. Connect the oscilloscope to the DO test point.
6) Verify that DO switches as expected.

Detailed Description of Hardware

The MAX14838 EV kit is a fully tested circuit board demonstrating the capabilities of the MAX14838 industrial binary sensor driver. The EV kit is designed to demonstrate all of the major features of the device.

Configuring the DO Output

The MAX14838 is a pin-configurable binary sensor driver that can be configured for NPN, PNP, or push-pull operation in a normally-open or normally-closed configuration. Set the NO (J2), PP (J3), and NPN (J5) jumpers high or low to configure the DO output. Table 2 shows the DO configuration settings.

LDO Linear Regulator

The MAX14838 features and intergrated 5V low-dropout linear regulator (VLDO) to power external loads up to 30mA.

LED Output Drivers (LEDS, LED2)

The MAX14838 EV kit includes two on-board LEDs for visual feedback.

The LEDS output (LED1) indicates the state of the DO driver. See Table 2.

The LED connected to the LED2 output (LED2) is a general-pupose LED and can be turned on or off with the $\overline{\text{LED2IN}}$ input. Connect the J4 jumper high (1-2) to turn the LED2 output off. Connect the J4 jumper low (1-4) to turn the LED2 output on.

The default connection for the J4 jumper (1-3) connects the $\overline{\text{LED2IN}}$ input to the $\overline{\text{FAULT}}$ output. In this configuration, the LED2 output turns on when $\overline{\text{FAULT}}$ goes low due to an overcurrent or thermal shutdown condition on DO.

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Table 1. Jumper Descriptions

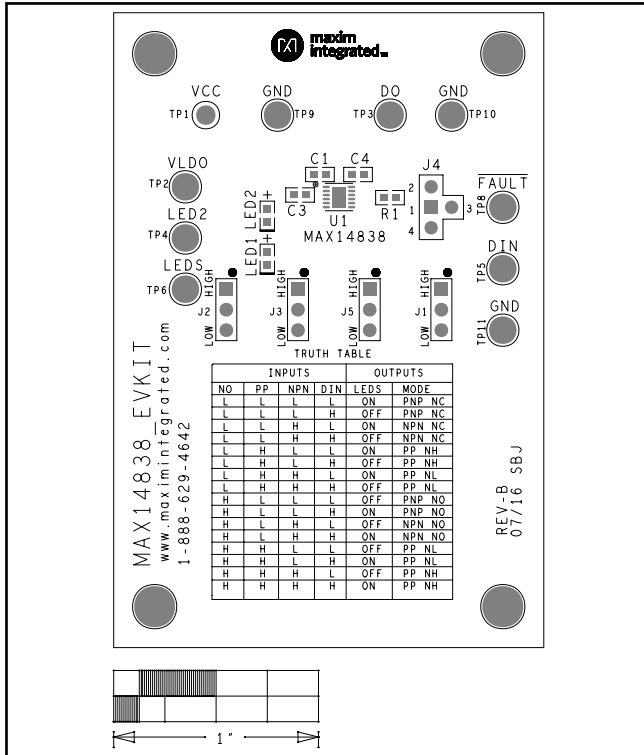| JUMPER	SHUNT POSITON	DESCRIPTION
J1	1-2	DIN is high.
	2-3*	DIN is low.
J2	1-2	NO is high.
	2-3*	NO is low.
J3	1-2	PP is high.
	2-3*	PP is low.
J4	1-2	$\overline{\text{LED2IN}}$ is high. The LED2 LED is off.
	1-3*	$\overline{\text{LED2IN}}$ is connected to $\overline{\text{FAULT}}$. In this configuration, the LED2 LED is used a fault indicator. LED2 turns on when an overcurrent or thermal shutdown fault occurs on DO.
	1-4	$\overline{\text{LED2IN}}$ is high is low. The LED2 LED is turned on.
J5	1-2	NPN is high.
	2-3*	NPN Is low.

Default position.

Table 2. DO Configuration Settings

INPUTS				OPERATION		
NO	PP	NPN	DIN	MODE	DO STATUS	LEDS
L	L	L	L	PNP NC	ON (High)	ON
L	L	L	H	PNP NC	OFF (High Impedance)	OFF
L	L	H	L	NPN NC	ON (Low)	ON
L	L	H	H	NPN NC	OFF (High Impedance)	OFF
L	H	L	L	Push-Pull NH	HIGH	ON
L	H	L	H	Push-Pull NH	LOW	OFF
L	H	H	L	Push-Pull NL	LOW	ON
L	H	H	H	Push-Pull NL	HIGH	OFF
H	L	L	L	PNP NO	OFF (High Impedance)	OFF
H	L	L	H	PNP NO	ON (High)	ON
H	L	H	L	NPN NO	OFF (High Impedance)	OFF
H	L	H	H	NPN NO	ON (Low)	ON
H	H	L	L	Push-Pull NL	LOW	OFF
H	H	L	H	Push-Pull NL	HIGH	ON
H	H	H	L	Push-Pull NH	HIGH	OFF
H	H	H	H	Push-Pull NH	LOW	ON

MAX14838 EV Bill of Materials

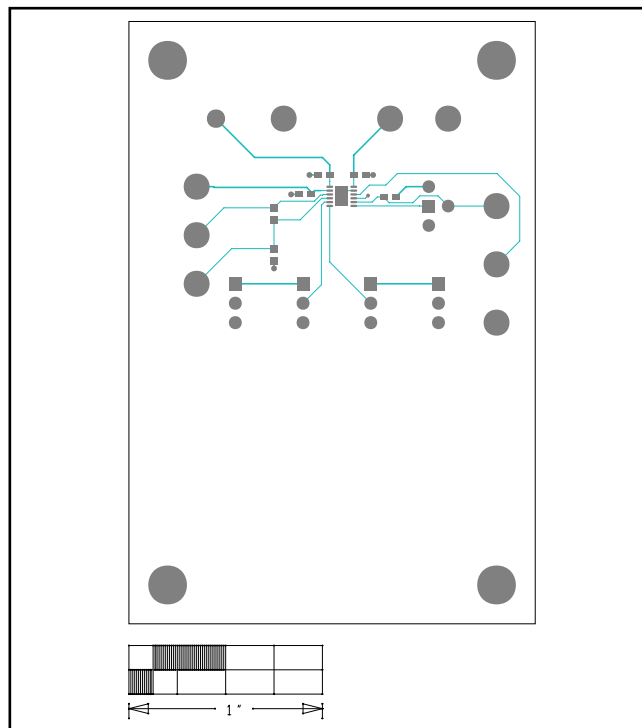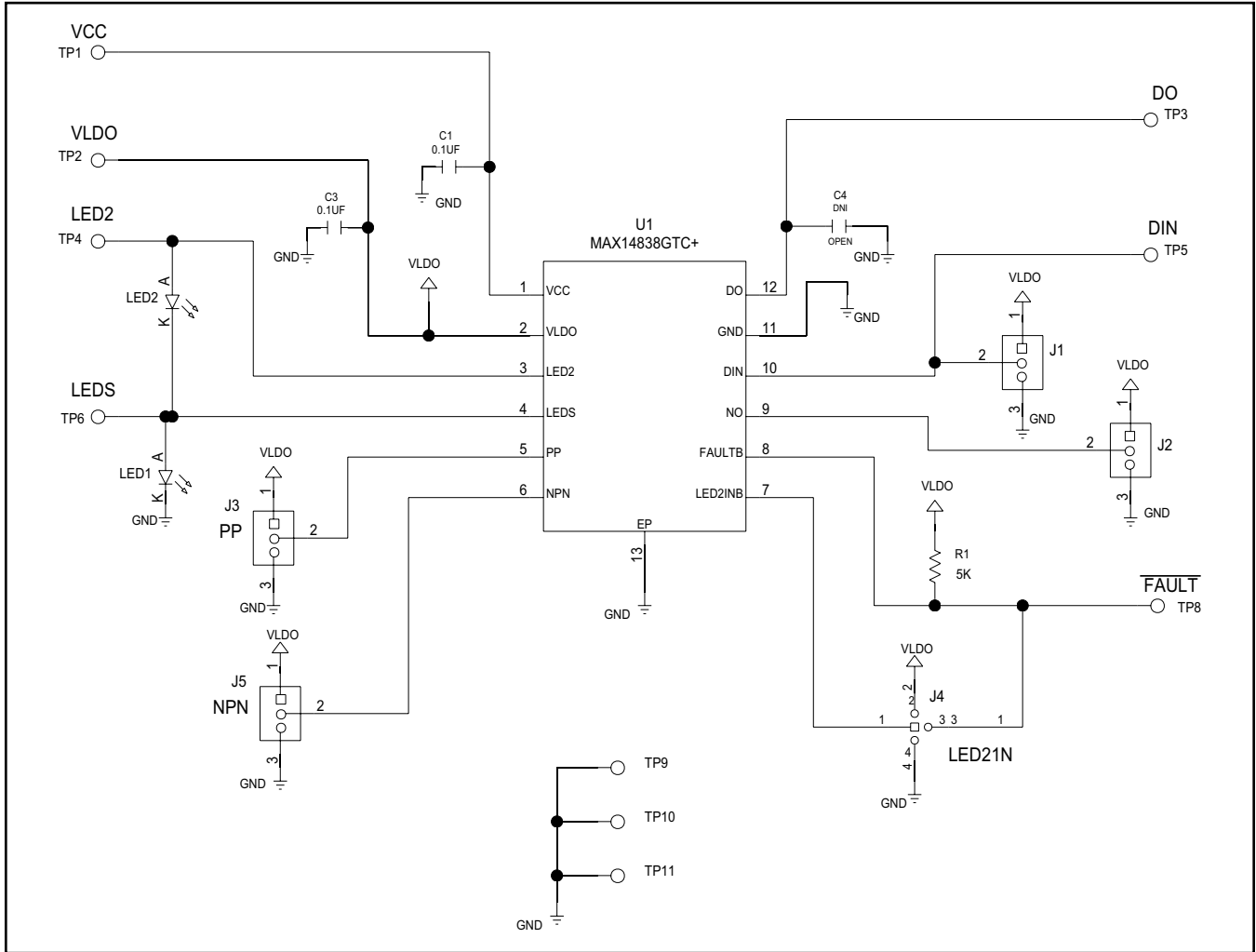| PART	QTY	DESCRIPTION
C1, C3	2	CAPACITOR; SMT (0603); CERAMIC CHIP; 0.1UF; 100V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R
J1-J3, J5	4	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT THROUGH; 3PINS; -65 DEGC TO +125 DEGC
J4	1	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 4PINS
LED1	1	DIODE; LED; LY L29K SERIES; SMARTLED; YELLOW; SMT (1608); VF=1.8V; IF=0.02A
LED2	1	DIODE; LED; SMART; RED; SMT (0603); PIV=1.8V; IF=0.02A; -40 DEGC TO +100 DEGC
R1	1	RESISTOR; 0603; 5K OHM; 0.1%; 25PPM; 0.15W; THIN FILM
SU1-SU5	5	TEST POINT; JUMPER; STR; TOTAL LENGTH=0.24IN; BLACK; INSULATION=PBT;PHOSPHOR BRONZE CONTACT=GOLD PLATED
TP1	1	TESTPOINT WITH 1.80MM HOLE DIA, RED, MULTIPURPOSE;
TP2-TP6, TP8	6	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; WHITE; PHOS-PHOR BRONZE WIRE SILVER PLATE FINISH;
TP9-TP11	3	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; BLACK; PHOS-PHOR BRONZE WIRE SILVER PLATE FINISH;
U1	1	IC; DRV; 24V PIN-CONFIGURABLE INDUSTRIAL SENSOR OUTPUT DRIVERS; TDFN12-EP
C4	0	PACKAGE OUTLINE 0603 NON-POLAR CAPACITOR
PCB	1	PCB Board:MAX14838 EVALUATION KIT

MAX14838 EV PCB Layout

MAX14838 EV Top Silkscreen

INPUTS				OUTPUTS	
NO	PP	NPN	DIN	LEDS	MODE
L	L	L	L	ON	PNP NC
L	L	L	H	OFF	PNP NC
L	L	H	L	ON	NPN NC
L	L	H	H	OFF	NPN NC
L	H	L	L	ON	PP NH
L	H	L	H	OFF	PP NH
L	H	H	L	ON	PP NL
L	H	H	H	OFF	PP NL
H	L	L	L	OFF	PNP NO
H	L	L	H	ON	PNP NO
H	L	H	L	OFF	NPN NO
H	L	H	H	ON	NPN NO
H	H	L	L	OFF	PP NL
H	H	L	H	ON	PP NL
H	H	H	L	OFF	PP NH
H	H	H	H	ON	PP NH

TRUTH TABLE
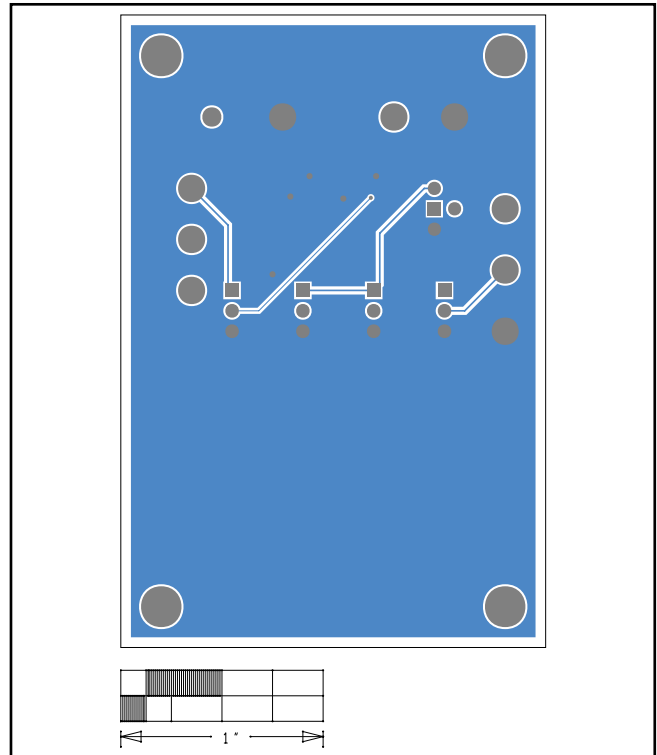
MAX14838 EV Bottom

MAX14838 EV Top

MAX14838 EV Schematic

Ordering Information

PART	TYPE
MAX14838EVKIT#	EV Kit

#Denotes RoHS compliant.

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	8/16	Initial release	—

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