

MAX38903 TDFN Evaluation Kit

Evaluates: MAX38903A/MAX38903B

General Description

The MAX38903 TDFN evaluation kit (EV kit) evaluates the MAX38903A/MAX38903B IC family of low noise linear regulators. The EV kit operates over an input range of 1.7V to 5.5V and provides any output voltage range from 0.6V to 5.3V, and delivers up to 1A of current. The EV kit comes with the MAX38903BATB+ installed.

Features

- Evaluates the MAX38903A/MAX38903B IC in a 10-pin (3mm x 3mm) TDFN
- 1.7V to 5.5V Input Range
- 0.6V to 5.3V Resistor Configurable Output Voltage (MAX38903B, On Board with Output Set to 3.3V)
- 1.2V to 5.0V Jumper Configurable Output Voltage (MAX38903A, with IC Replacement)
- Up to 1A Output Current
- Proven 2-Layer 1 oz Copper PCB Layout
- Demonstrates Compact Solution Size
- Fully Assembled and Tested

Ordering Information appears at end of data sheet.

MAX38903 TDFN EV Kit Files

| FILE | DESCRIPTION |
|---------------------------------|-------------------------|
| MAX38903 TDFN EV Kit BOM | EV Kit Bill of Material |
| MAX38903 TDFN EV Kit PCB Layout | EV Kit Layout |
| MAX38903 TDFN EV Kit Schematic | EV Kit Schematic |

Quick Start

Required Equipment

- MAX38903 TDFN EV kit
- 5.5V, 1A DC power supply
- Electronic load capable of 1A
- Digital voltmeter (DVM)

Procedure

The EV kit is fully assembled and tested. Follow the steps below to verify board operation.

Caution: Do not turn on power supply until all connections are completed.

- 1) Verify that jumpers JU101, SELA and SELB are in their default positions, as shown in Tables 1, 2, and 3.
- 2) Connect the 5.5V power supply between the IN and nearest GND terminal posts.
- 3) Connect the 1A electronic load between the OUT and nearest GND terminal posts.
- 4) Connect the DVM between the OUT and nearest GND terminal posts.
- 5) Turn on the power supply.
- 6) Enable the electronic load.
- 7) Verify that the voltage at the OUT terminal post is approximately 3.3V.

Detailed Description of Hardware

The MAX38903 TDFN EV kit evaluates the MAX38903A/MAX38903B IC family. The MAX38903A/MAX38903B are low noise linear regulators that deliver 1A of output current with only 12uV_{RMS} of output noise from 10Hz to 100kHz. These regulators require only 100mV of input-to-output headroom at full load.

The MAX38903 TDFN EV kit operates over an input range of 1.7V to 5.5V. The EV Kit comes with the MAX38903BATB + installed and the output voltage is resistor configured to 3.3V and can deliver 1A of current. The output voltage on the MAX38903B can be reconfigured to other voltages from 0.6V to 5.3V by replacing feedback resistors R101 and R102. Refer to the MAX38903 IC data sheet for feedback resistor calculation.

EN for the MAX38903A/B

The EV kit provides a jumper JU101 to enable or disable the MAX38903B (or the MAX38903A after IC replacement). Refer to [Table 1](#) for jumper setting of jumper JU101.

GS for the MAX38903B

When evaluating the MAX38903B, the Ground Sense (GS) pin must be connected to ground to stabilize the output with load. The EV kit provides a jumper SELA to connect the MAX38903B GS pin to ground. Refer to [Table 2](#) for jumper setting of jumper SELA.

POK for the MAX38903B

The EV kit provides a test point to access the POK output signal from the MAX38903B. Remove shunt from jumper SELB to access the MAX38903B POK test point. Refer to [Table 3](#) for jumper setting of jumper SELB.

Table 1. EN on MAX38903A/B (JU101)

| JU101 SHUNT POSITION | DESCRIPTION |
|----------------------|--------------------|
| 1-2* | Enabled. EN = IN |
| 2-3 | Disabled. EN = GND |

*Default position.

Table 2. GS on MAX38903B (SELA)

| SELA SHUNT POSITION | DESCRIPTION |
|---------------------|--|
| 1-2 | Not allowed (for MAX38903A output selection) |
| 2-3* | GS = GND |

*Default position.

Table 3. POK on MAX38903B (SELB)

| SELA SHUNT POSITION | DESCRIPTION |
|---------------------|--|
| 1-2 | Not allowed (for MAX38903A output selection) |
| 2-3 | Not allowed (for MAX38903A output selection) |
| Not Installed* | Access signal at the POK test point |

*Default position.

Evaluating the MAX38903A

The EV kit can evaluate the MAX38903A after IC (U1) replacement. When evaluating the MAX38903A, modify the EV kit with the steps listed below:

- 1) Replace U1 with the MAX38903AATB+.
- 2) Replace R101 with a 0Ω resistor.
- 3) Remove R102.
- 4) Refer to [Table 4](#) to configure the MAX38903A output voltage using jumpers SELA and SELB.

Output Selection (SELA and SELB) for the MAX38903A

The EV kit provides a set of jumpers SELA and SELB to configure the output voltage of the MAX38903A, after IC (U1) replacement. Refer to [Table 4](#) for jumper setting of jumpers SELA and SELB.

Table 4. SELA and SELB on MAX38903A (SELA, SELB)

| SELA | | SELB | | OUTPUT VOLTAGE |
|----------------|-----------------|----------------|-----------------|----------------|
| SHUNT POSITION | SELA CONNECTION | SHUNT POSITION | SELB CONNECTION | |
| Not Installed | Hi-Z | 1-2 | IN | 1.2 |
| 1-2 | IN | Not Installed | Hi-Z | 1.5 |
| Not Installed | Hi-Z | 2-3 | GND | 1.8 |
| Not Installed | Hi-Z | Not Installed | Hi-Z | 2.5 |
| 2-3 | GND | 2-3 | GND | 3.0 |
| 2-3 | GND | 1-2 | IN | 3.1 |
| 2-3 | GND | Not Installed | Hi-Z | 3.3 |
| 1-2 | IN | 2-3 | GND | 4.0 |
| 1-2* | IN | 1-2* | IN | 5.0 |

*Default position.

Component Suppliers

| SUPPLIER | WEBSITE |
|---|--------------------|
| Murata/TOKO | www.murata.com |
| TDK | www.tdk.com |
| Samsung Electro-Mechanics America, Inc. | www.samsungsem.com |

Note: Indicate that you are using the MAX38903A/B when contacting these component suppliers.

Ordering Information

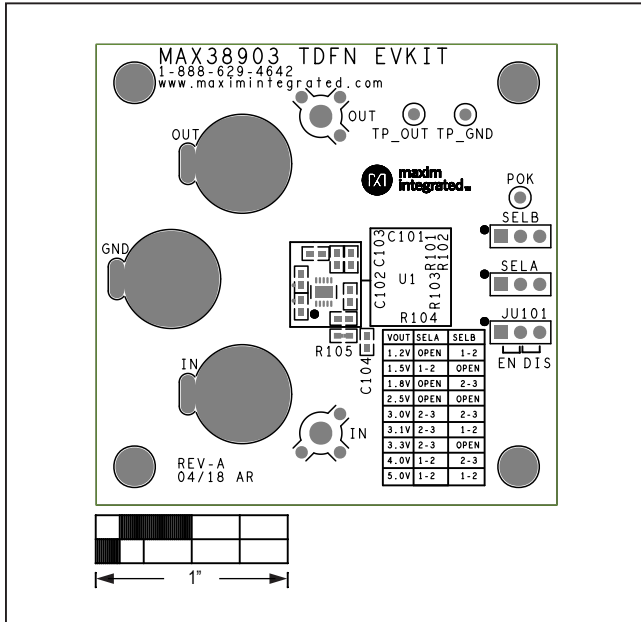
| PART | TYPE |
|--------------------|--------|
| MAX38903EVKIT#TDFN | EV Kit |

#Denotes RoHS

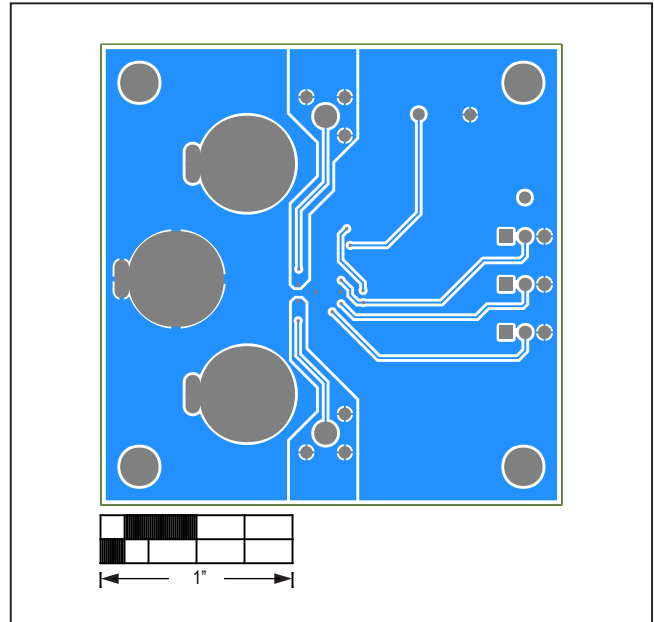
MAX38903 TDFN EV Kit Bill of Materials

| ITEM | REF_DES | DN/DNP | QTY | MFG PART # | MANUFACTURER | VALUE | DESCRIPTION | COMMENTS |
|-------|--------------------------------|--------|-----|--|------------------------------|---------------|---|-----------------------|
| 1 | C101 | - | 1 | C0603C473K5RAC; GCM188R71H473K; GRM188R71H473K | KEMET;MURATA; MURATA | 0.047UF | CAPACITOR; SMT (0603); CERAMIC CHIP; 0.047UF; 50V; TOL=10%; MODEL=X7R; TG=-55 DEGC TO +125 DEGC; TC= | |
| 2 | C102, C103 | - | 2 | CL10B106MQ8NRN | SAMSUNG ELECTRONICS | 10UF | CAPACITOR; SMT (0603); CERAMIC CHIP; 10UF; 6.3V; TOL=20%; MODEL=CL SERIES; TG=-55 DEGC TO +125 DEGC; TC=X7R | |
| 3 | GND, IN, OUT | - | 3 | 108-0740-001 | EMERSON NETWORK POWER | 108-0740-001 | CONNECTOR; MALE; PANELMOUNT; BANANA JACK; STRAIGHT; 1PIN | |
| 4 | GND_PAD, IN_PAD, OUT_PAD | - | 3 | 9020 BUSS | WEICO WIRE | MAXIMPAD | EVK KIT PARTS; MAXIM PAD; WIRE; NATURAL; SOLID; WEICO WIRE; SOFT DRAWN BUS TYPE-S; 20AWG | |
| 5 | JU101, SELA, SELB | - | 3 | PEC03SAAN | SULLINS | PEC03SAAN | CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 3PINS | |
| 6 | POK | - | 1 | 5002 | KEYSTONE | N/A | TEST POINT; PIN DIA=0.1IN; TOTAL LENGTH=0.3IN; BOARD HOLE=0.04IN; WHITE; PHOSPHOR BRONZE WIRE SILVER; | |
| 7 | R101 | - | 1 | CRCW0603909KFK | VISHAY DALE | 909K | RESISTOR; 0603; 909K OHM; 1%; 100PPM; 0.1W; THICK FILM | |
| 8 | R102 | - | 1 | ERJ-3EKF2003 | PANASONIC | 200K | RESISTOR; 0603; 200K OHM; 1%; 100PPM; 0.1W; THICK FILM | |
| 9 | R103 | - | 1 | CRCW0603100KFK | VISHAY DALE | 100K | RESISTOR; 0603; 100K; 1%; 100PPM; 0.10W; THICK FILM | |
| 10 | SU1-SU3 | - | 3 | STC02SYAN | SULLINS ELECTRONICS CORP. | STC02SYAN | TEST POINT; JUMPER; STR; TOTAL LENGTH=0.256IN; BLACK; INSULATION=PBT CONTACT=PHOSPHOR BRONZE; COPPER PLATED TIN OVERALL | |
| 11 | TP1, TP6 | - | 2 | 131-4353-00 | TEKTRONICS | 131-4353-00 | CONNECTOR; WIREMOUNT; CIRCUITBOARDTESTPOINTMINIAT UREPROBE; STRAIGHT; 4PINS | (TP1:IN) (TP6:OUT) |
| 12 | TP_GND | - | 1 | 5001 | KEYSTONE | N/A | TEST POINT; PIN DIA=0.1IN; TOTAL LENGTH=0.3IN; BOARD HOLE=0.04IN; BLACK; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH; | |
| 13 | TP_OUT | - | 1 | 5000 | KEYSTONE | N/A | TEST POINT; PIN DIA=0.1IN; TOTAL LENGTH=0.3IN; BOARD HOLE=0.04IN; RED; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH; | |
| 14 | U1 | - | 1 | MAX38903BATB+ | MAXIM | MAX38903BATB+ | EVKIT PART-IC; PACKAGE CODE: T1033+1C; PACKAGE OUTLINE NUMBER: 21-0137 | |
| 15 | PCB | - | 1 | MAX38903TDFN | MAXIM | PCB | PCB:MAX38903TDFN | - |
| 16 | C104 | DNP | 0 | N/A | N/A | OPEN | PACKAGE OUTLINE 0603 NON-POLAR CAPACITOR | |
| 17 | R104 | DNP | 0 | N/A | N/A | OPEN | PACKAGE OUTLINE 0603 RESISTOR | |
| 18 | R105 | DNP | 0 | N/A | N/A | SHORT | PACKAGE OUTLINE 0603 RESISTOR | |
| TOTAL | | | 25 | | | | | |

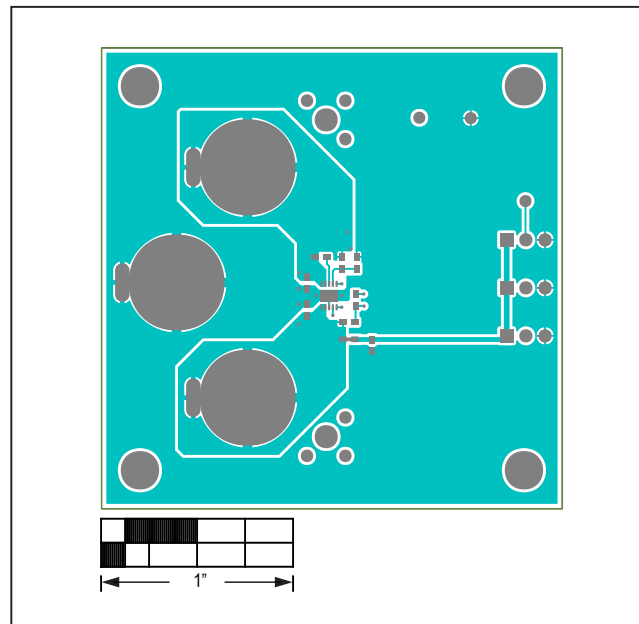
MAX38903 TDFN EV Kit PCB Layout Diagrams



MAX38903 EV Kit—Top Silkscreen



MAX38903 EV Kit—Top



MAX38903 EV Kit—Bottom

Revision History

| REVISION NUMBER | REVISION DATE | DESCRIPTION | PAGES CHANGED |
|-----------------|---------------|-----------------|---------------|
| 0 | 10/18 | Initial release | — |

For pricing, delivery, and ordering information, please visit Maxim Integrated's online storefront at <https://www.maximintegrated.com/en/storefront/storefront.html>.

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