

MAX15101/MAX15102/MAX15103 Evaluation Kits

Evaluate: MAX15101/MAX15102/MAX15103

General Description

The MAX15101/MAX15102/MAX15103 evaluation kits (EV kits) provide a proven design to evaluate the MAX15101/MAX15102/MAX15103 small, low-dropout linear regulators capable of delivering up to 1A, 2A, or 3A in a wafer-level package (WLP). The EV kits are preset for 1.5V output at load currents of 1A for the MAX15101, 2A for the MAX15102, and 3A for the MAX15103. The EV kits offer an enable input and power-good output and are capable of operating from a 1.7V to 5.5V supply. Refer to the *Operating Region and Power Dissipation* section in the respective IC data sheet when operating at the higher end of the input supply range.

Features

- ◆ **1.7V to 5.5V Input Voltage Range**
- ◆ **Output Current**
 - 1A for MAX15101**
 - 2A for MAX15102**
 - 3A for MAX15103**
- ◆ **Output Voltage Range: 0.6V Up to ($V_{IN} - 200mV$)**
- ◆ **200mV Dropout Guaranteed at 3A**
- ◆ **Enable Input/Power-Good Output**
- ◆ **Proven PCB Layout**
- ◆ **Fully Assembled and Tested**

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

Component List

DESIGNATION	QTY	DESCRIPTION
C1	1	2.2 μ F $\pm$ 10%, 10V X7R ceramic capacitor (0603) TDK C1608X5R1A225M
C2	1	22 μ F $\pm$ 10%, 6.3V X5R ceramic capacitor (0603) Samsung CL10A226MQ8NRNE Taiyo Yuden AMK107BBJ226MA-T
C3	1	0.1 μ F $\pm$ 10%, 50V X7R ceramic capacitor (0603) Murata GRM188R71H104K TDK C1608X7R1H104K
C4	0	Not installed, aluminum electrolytic capacitor (12.5mm x 25mm)

DESIGNATION	QTY	DESCRIPTION
C5, C7	0	Not installed, ceramic capacitors (0805)
C6, C8	0	Not installed, ceramic capacitors (1206)
JU1	1	2-pin header
R1	1	909 Ω $\pm$ 1% resistor (0603)
R2	1	604 Ω $\pm$ 1% resistor (0603)
R5, R7	2	100k Ω $\pm$ 5% resistors (0603)
R6	0	Not installed, resistor (0603)
U1	1	See the <i>EV Kit-Specific Component List</i>
—	1	Shunt
—	1	PCB: MAX15101/2/3 EVALUATION KIT

EV Kit-Specific Component List

PART	DESIGNATION	DESCRIPTION
MAX15101EVKIT#	U1	1A low-dropout linear regulator (15 WLP) Maxim MAX15101EWL+T
MAX15102EVKIT#		2A low-dropout linear regulator (15 WLP) Maxim MAX15102EWL+T
MAX15103EVKIT#		3A low-dropout linear regulator (15 WLP) Maxim MAX15103EWL+T

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Component Suppliers

SUPPLIER	PHONE	WEBSITE
Murata Electronics North America, Inc.	770-436-1300	www.murata-northamerica.com
Samsung Electro-Mechanics	949-797-8047	www.sem.samsung.com
Taiyo Yuden	800-348-2496	www.t-yuden.com
TDK Corp.	847-803-6100	www.component.tdk.com

Note: Indicate that you are using the MAX15101, MAX15102, or MAX15103 when contacting these component suppliers.

Quick Start

Recommended Equipment

- MAX15101, MAX15102, or MAX15103 EV kit
- 1.7V to 5.5V, 3A DC power supply
- Load capable of sinking up to 3A
- Digital voltmeter

Procedure

The EV kits are fully assembled and tested. Follow the steps below to verify the board operation. **Caution: Do not turn on power supply until all connections are completed.**

- 1) Connect the positive terminal of the 5V supply to the IN PCB pad and the negative terminal to the nearest PGND PCB pad.
- 2) Connect the positive terminal of the load to the OUT PCB pad and the negative terminal to the nearest PGND PCB pad.
- 3) Connect the digital voltmeter across the OUT PCB pad and the nearest PGND PCB pad.
- 4) Verify that a shunt is installed on jumper JU1.
- 5) Turn on the DC power supply.
- 6) Enable the load.
- 7) Verify that the voltmeter displays 1.5V.

Detailed Description of Hardware

Regulator Enable (EN)

The MAX15101/MAX15102/MAX15103 feature an enable input. For normal operation, a shunt should be installed on jumper JU1. To disable the output, remove the shunt on JU1 and the EN pin is pulled to GND through resistor R7. See Table 1 for JU1 settings.

Table 1. Regulator Enable (EN) Jumper JU1 Description

SHUNT POSITION	EN PIN	DEVICE OUTPUT
Installed*	Connected to IN	Enabled
Not installed	Pulled to GND through R7	Disabled

*Default position.

Bypass/Soft-Start Input (SS_BYP)

The MAX15101/MAX15102/MAX15103 utilize an adjustable soft-start function to limit inrush current during startup and reduce the output noise. The soft-start time is adjusted by the value of C3, the external capacitor from SS_BYP to GND. By default, C3 is currently 0.1μF, which gives a soft-start time of approximately 6.5ms. To determine the soft-start time, determine t_{SS} using the following formula:

$$t_{SS} = 6.315 \times 10^{-5} \times C3$$

where t_{SS} is the required soft-start time in seconds and C3 is in nanofarads. C3 should be a minimum 4.7nF capacitor between SS_BYP and GND.

Setting the Output Voltage

The EV kit can be adjusted from 0.6V up to $[V_{IN} - 200mV]$ by changing the values of resistors R1 and R2. To determine the value of the resistor-divider, set R2 to 604Ω, and then use the following equation to calculate R1:

$$R1 = R2 \left[\left(\frac{V_{OUT}}{V_{FB}} \right) - 1 \right]$$

where V_{FB} is equal to the 0.6V and V_{OUT} is the output.

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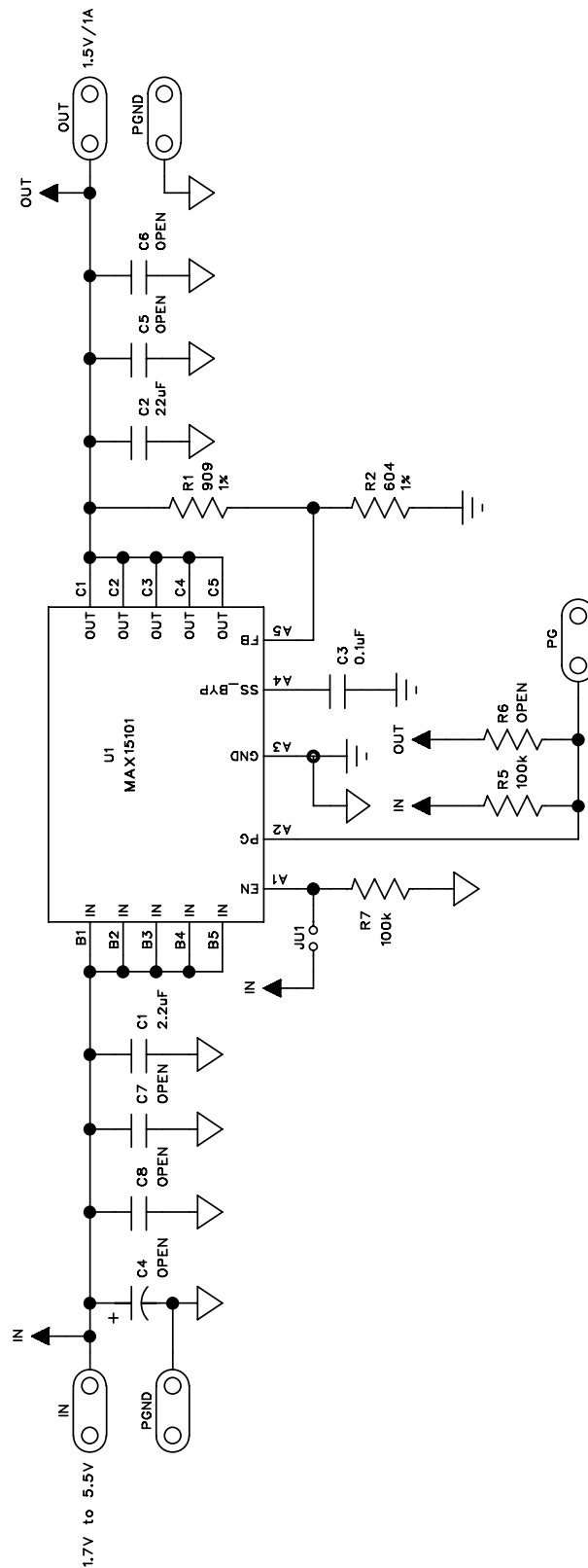


Figure 1. MAX15101 EV Kit Schematic

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Evaluate: MAX15101/MAX15102/MAX15103

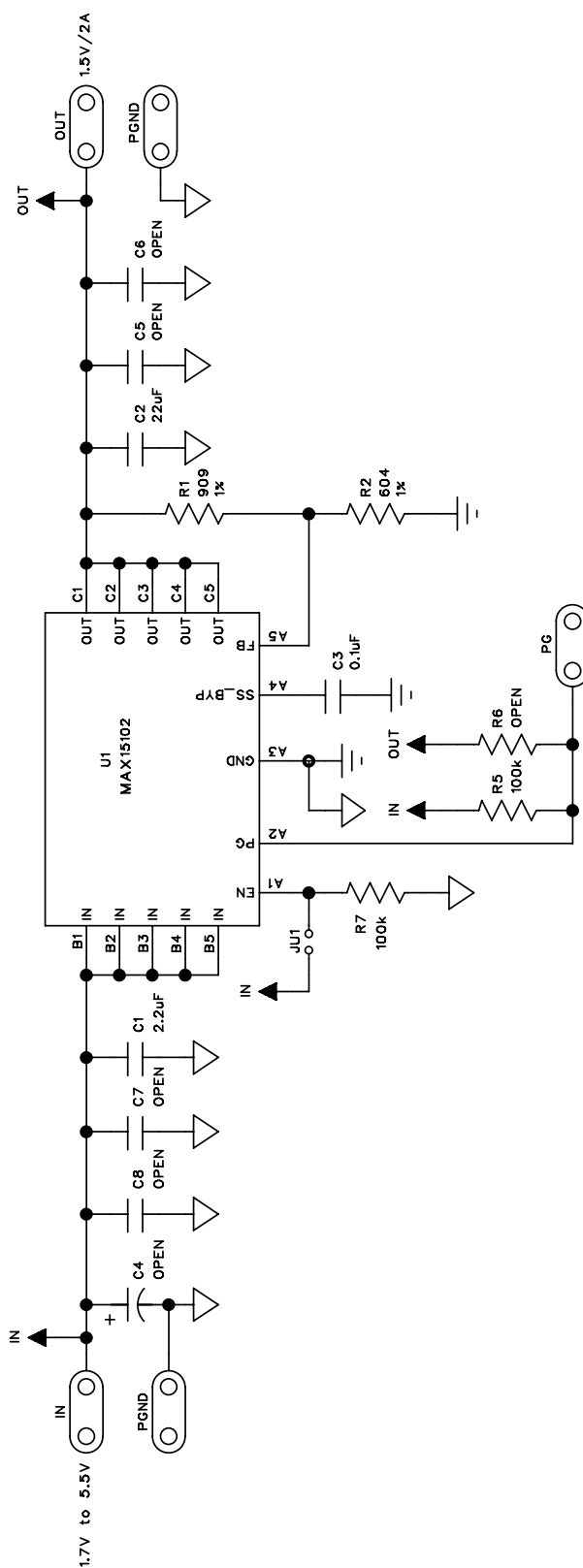


Figure 2. MAX15102 EV Kit Schematic

MAX15101/MAX15102/MAX15103 Evaluation Kits

Evaluate: MAX15101/MAX15102/MAX15103

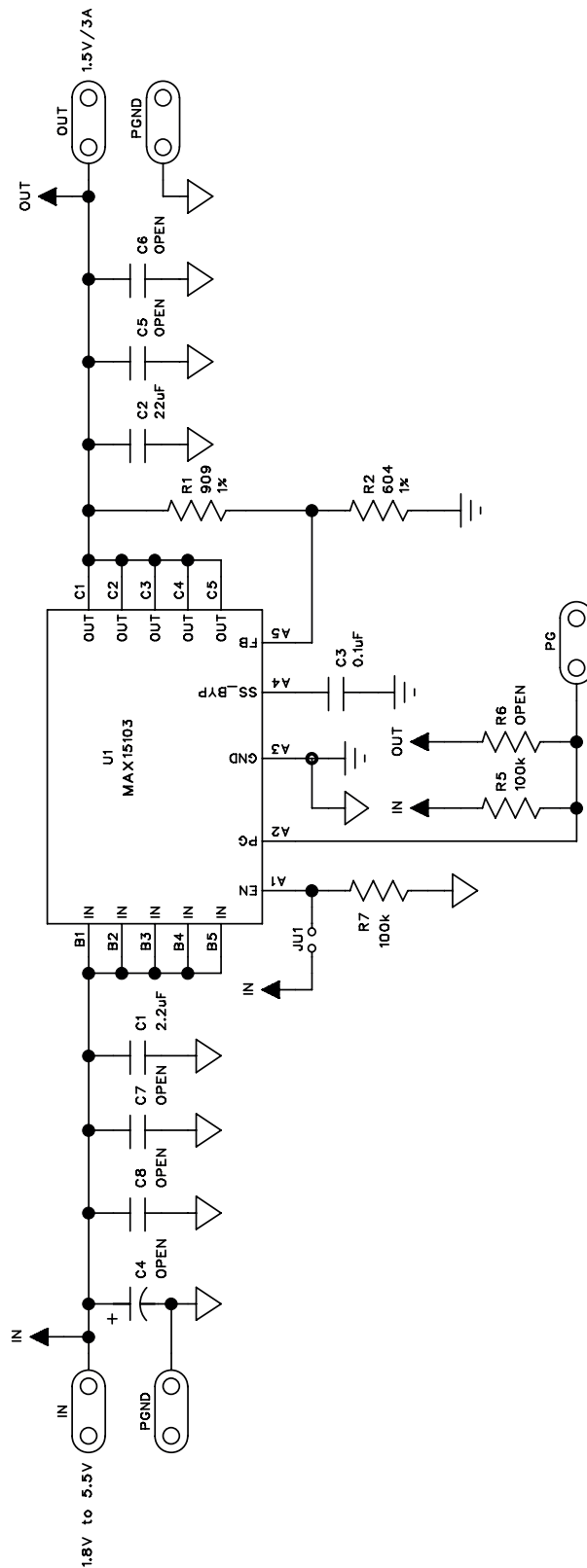


Figure 3. MAX15103 EV Kit Schematic

MAX15101/MAX15102/MAX15103 Evaluation Kits

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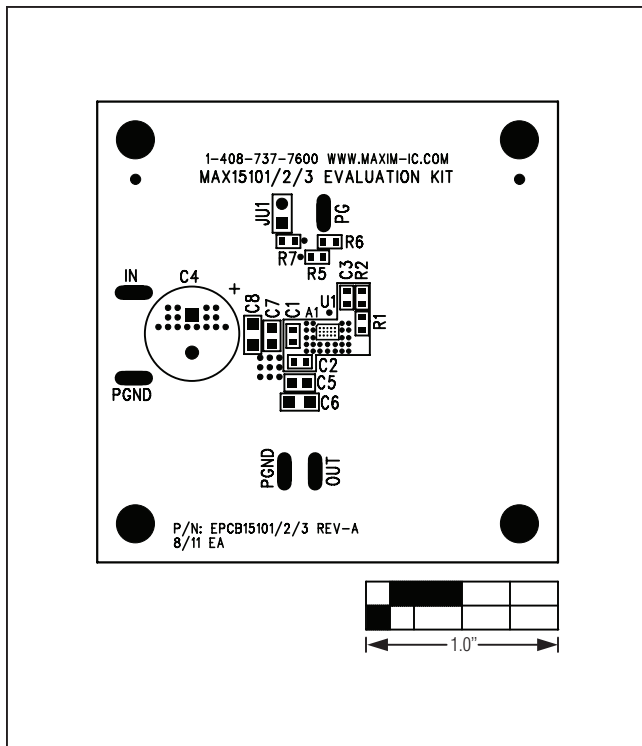


Figure 4. MAX15101/MAX15102/MAX15103 EV Kits Component Placement Guide—Component Side

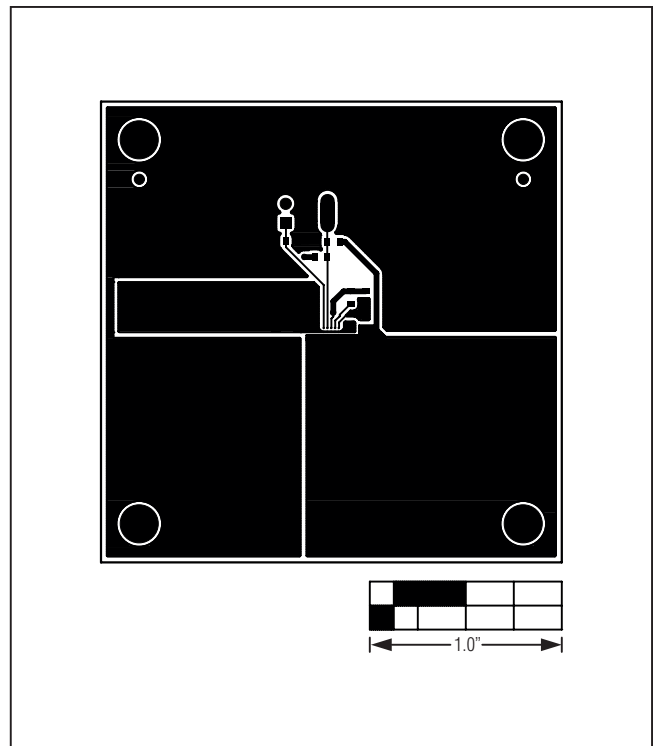


Figure 5. MAX15101/MAX15102/MAX15103 EV Kits PCB Layout—Component Side

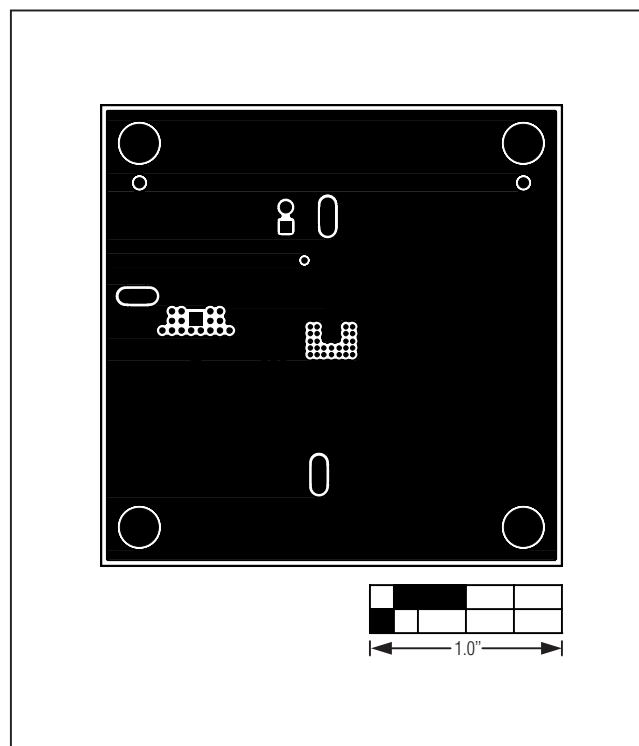


Figure 6. MAX15101/MAX15102/MAX15103 EV Kits PCB Layout—Inner Layer 2 GND

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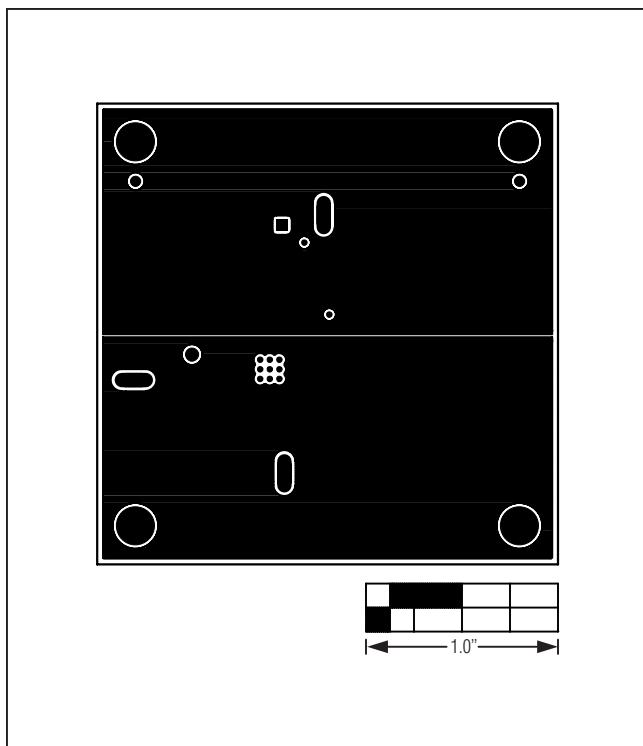


Figure 7. MAX15101/MAX15102/MAX15103 EV Kits PCB Layout—Inner Layer 3 Power

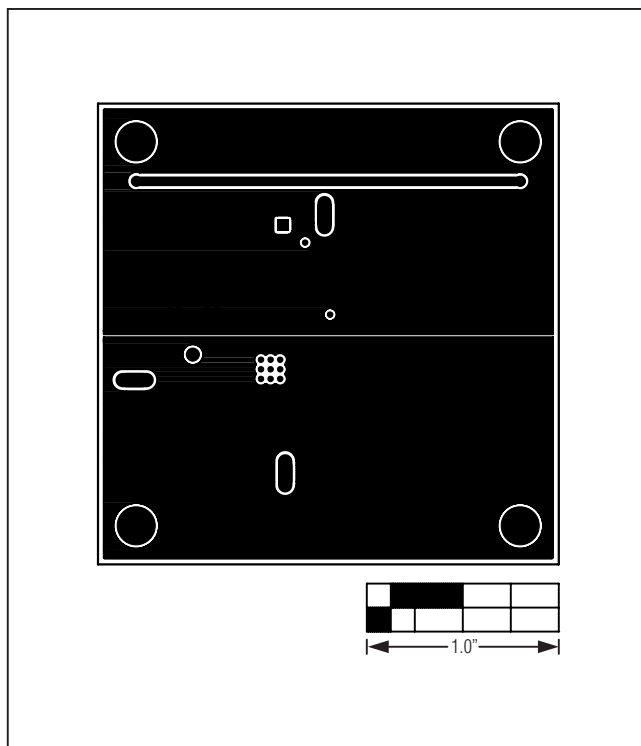


Figure 8. MAX15101/MAX15102/MAX15103 EV Kits PCB Layout—Solder Side

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Ordering Information

PART	TYPE
MAX15101EVKIT#	EV Kit
MAX15102EVKIT#	EV Kit
MAX15103EVKIT#	EV Kit

#Denotes RoHS compliant.

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Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	9/11	Initial release	—



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