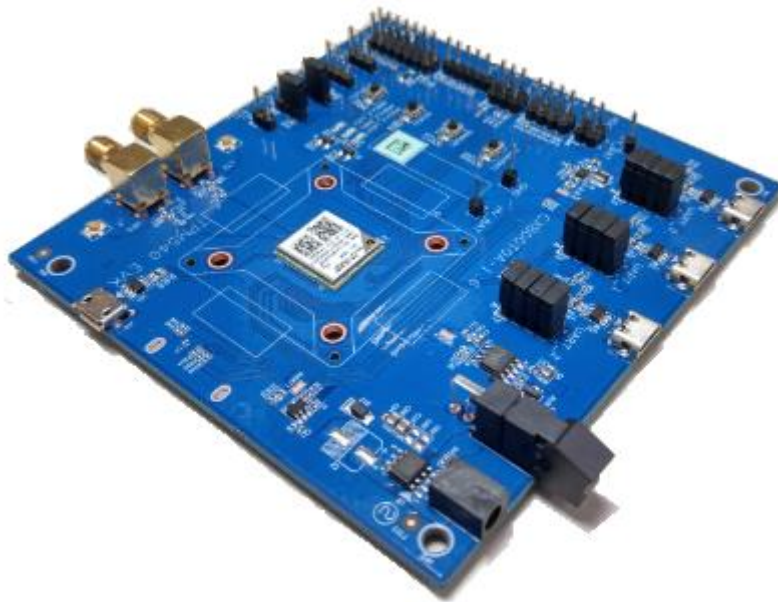


# TPM540 EVK USER GUIDE



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Ver 1.0

## Document Revision History

Revision History		
Rev	Date	Description
V1.0	04/11/2017	Initial Release V1.0

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## 1. Introduction

### 1.1. Document Purpose

The purpose of this document is to introduce TPM540 EVK and to provide a design reference. EVK also enables users to make a prototype on TPM540 platform which resembles the actual target during the design and build phases of a project. It makes the design efforts of a user simple, cost-effective and fast. Various interfaces which is included on the board make the development board ideal for a wide variety of applications. The EVK leverages the capability of the TPM540 LTE Cat. M1 cellular module and provides access to a variety of interfaces including UART, USB, USIM.

### 1.2. Kit contents

- Three USB to Micro USB Cables
- TPM540 EVK
- One SMA-type Antenna

## 2. EVK functions introduce

### 2.1. EVK Block Diagram

Figure 2.1 illustrates TPM540 EVK Block diagram and shows available interfaces for reference .

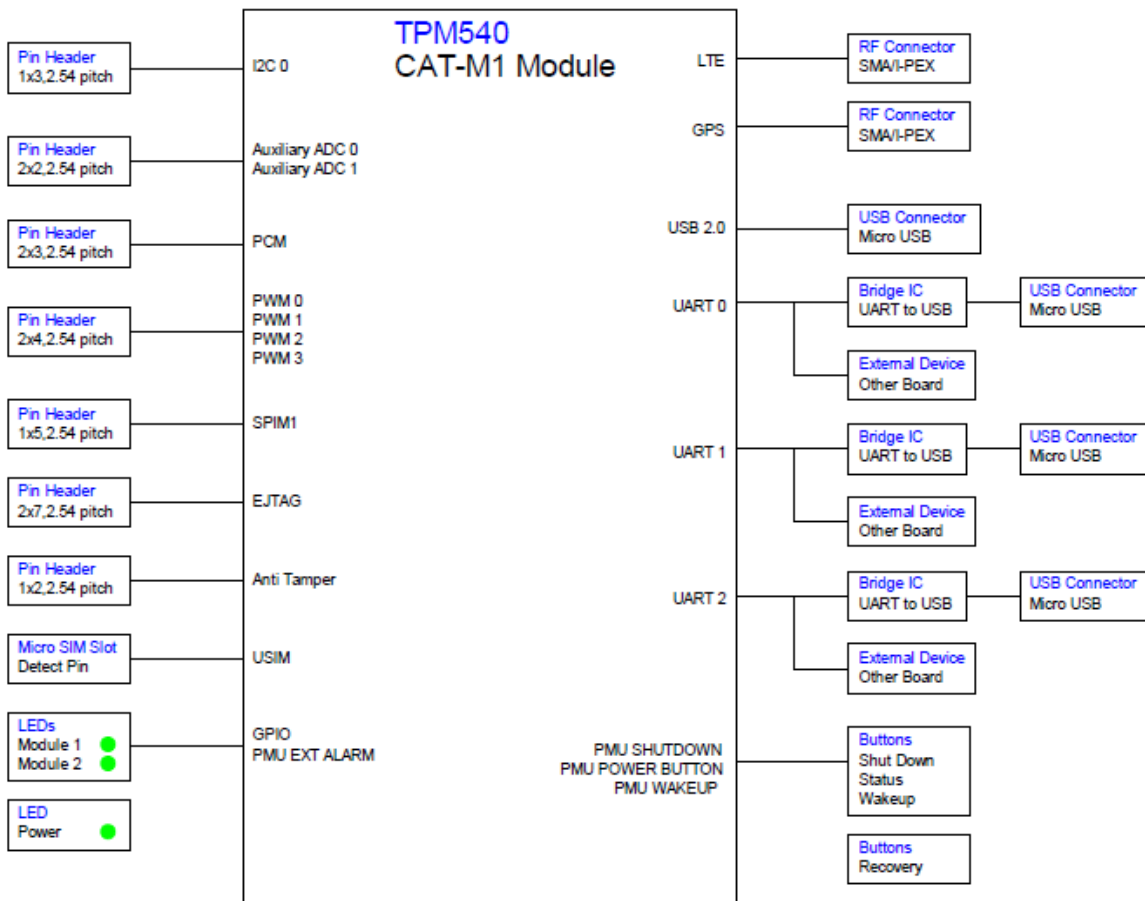


Figure 2.1

### 2.2. EVK Interfaces

Table 2.2 lists TPM540 available interfaces on EVK for reference .

**Table 2.2**

Interface	Note
UART0/J3	AT commands UART interface, default baud rate: 115200
UART1/J2	Console Log UART interface, default baud rate: 115200
UART2/J7	CLI/Firmware upgrade UART interface, default baud rate: 115200
USIM/J17	SIM card slot, supports 3FF, micro SIM card
JP5	UART0 to USB/external MCU switch jump.
JP2	UART1 to USB/external MCU switch jump.
JP1	UART2 to USB/external MCU switch jump.
J19	TPM540 USB interface
S2	Power switch
J8/J21	RF_GNSS interface
J6/J11	RF_LTE interface
J1	5V DC input

### 3. Starting with TPM540 EVK

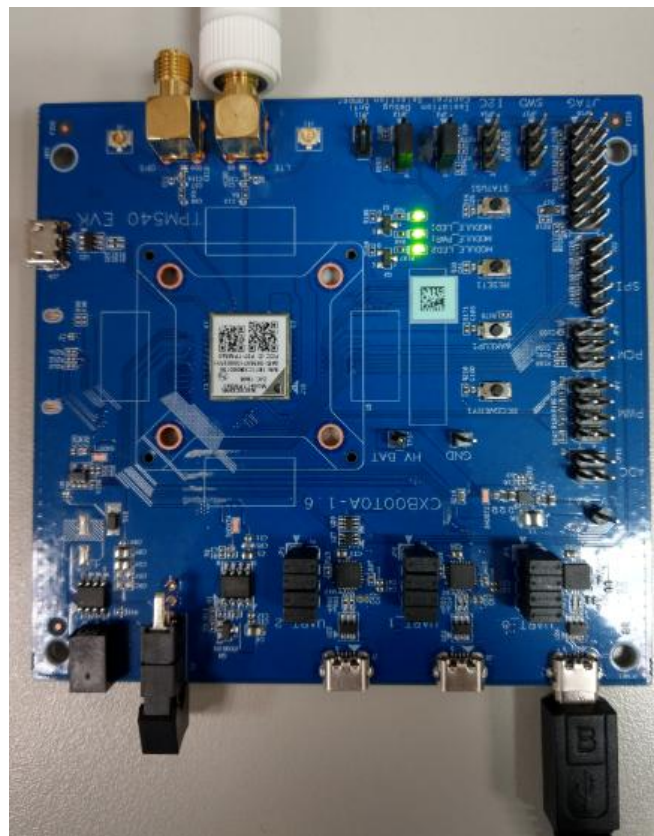
#### 3.1. Hardware preparation and setup

- Attach the included antenna to the SMA connector J21
- Plug-in the included DC adapter to DC Jack J1  
Or each UART to USB cable.
- Plug-in 3FF SIM card to J17(back side of EVK)
- Switch on S2(Power switch) to turn on TPM540.

There is no need to turn on S2 while using USB cable to power up EVK

Figure 3.1

Module PWR1 LED will be lighted when turning on EVK successfully.



### 3.2. Software preparation and setup

- Prepare and install Silicon Lab CP210X UART to USB Driver, Version 6.7 (Please access Silicon Lab website to download driver.)
- Prepare Serial Port Terminal Tool (Putty, SecureCRT, Teraterm..etc)

### 3.3. Starting to access EVK and TPM540

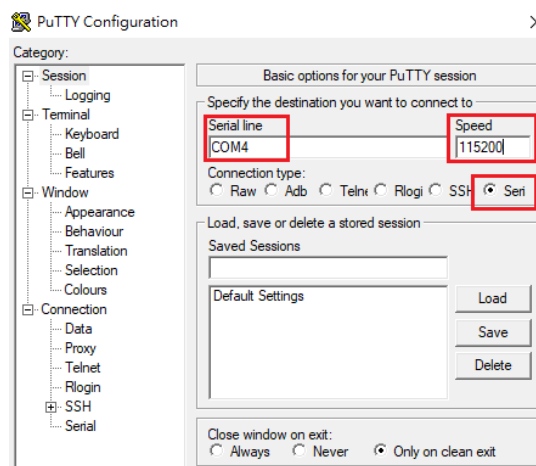
- Turn on EVK
- Connect UART0 to PC via USB cable.
- Setup Terminal tools, please refer figure 3.3

COM port: com port will be enumerated on Windows device manager

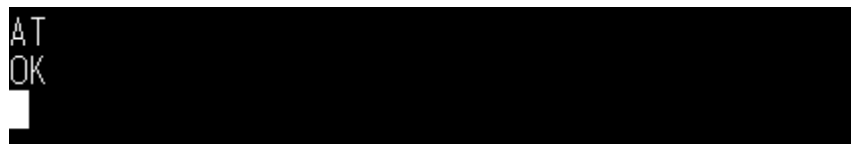


Setting Baud rate for UART0: default is 115200.

Figure 3.3 for putty setting.



- Opening terminal tools and sending **AT** command from UART.





## 4. Button introduce

### 4.1. RECOVERY button:

This button is used to enter boot ROM mode for firmware upgrade and recovery system when device cannot boot up by some reason. Please visit Sercomm technical support website and issue a ticket when you have problem with boot up your TPM540.

### 4.2. WAKEUP button:

This button is connecting to PMU\_WAKEUP ping and used to wakeup TPM540 while device is under power saving mode.

When there is no traffic, TPM540 will get into power saving mode immediately and TPM540 cannot receive and deal any commands from host. Please push the button to wakeup module and send AT commands.

### 4.3. RESET button:

This button is connecting to PMU\_SHUTDOWN pin for initiating power cycle that resets the device or shutdowns device. (For reset function, please pull low button at least 100ms)

### 4.4. STATUS button:

This button is connecting to PMU\_POWER\_BUTTON pin and it can be used to either go into power down mode when device is awake or waking up the device from low power mode. While PMU\_SHUTDOWN and PMU\_WAKEUP cause an immediate action, PMU\_POWER\_BUTTON reaction is not immediate and involves SW response.

## 5. LED status

### 5.1. Module\_PWR1 LED:

For VCC status indication.

ON: VCC is present.

OFF: VCC is absent.

VCC is provided by 5V to 3.3V LDO.

### 5.2. Module\_LED1:

This LED is controlled by PMU\_EXT\_ALARM pin, it can be used for alarming an external host.

TBD

### 5.3. Module\_LED2:

TBD

## 6. Special hardware configuration pins

### 6.1. SWD(JP17): TBD

SWDAT and SWCLK switch

### 6.2. Isolation control(JP3):

3.3V to 1.8V level shift ICs(U3,U10,U11) control.

H: Turn off level shift ICs

L: Turn on level shift ICs

Default is connected to Low.

### 6.3. Debug Selection(JP12):

HW pin for EJTAG chain select:

PD for MIPS chain.

PU for ARM chain.

Default setting is internal PD in TPM540.

### 6.4. Anti Tamper(JP11): TBD

User can connect PMU\_AT\_OUT to PMU\_AT\_IN in order to protect its device or module from tampering.

Default setting is floating on EVK.

## 7. Firmware Upgrade

TBD

### 8. Federal Communication Commission Interference Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

#### **FCC Caution:**

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

#### **Radiation Exposure Statement:**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

#### **This device is intended only for OEM integrators under the following conditions:**

- 1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
- 2) The transmitter module may not be co-located with any other transmitter or antenna.

As long as 2 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed

**IMPORTANT NOTE:** In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and

obtaining a separate FCC authorization.

### **End Product Labeling**

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains FCC ID: P27-TPM540". The grantee's FCC ID can be used only when all FCC compliance requirements are met.

### **Manual Information To the End User**

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.

This module can only be used with a host antenna circuit trace layout design in strict compliance with the OEM instructions provided.