

# S76G/S78G

# SDK#1

# Readme

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| <b>Document Name</b> | <b>S76G/S78G SDK#1 Readme</b> |
| <b>Version</b>       | <b>V0.0.4 with GPS</b>        |
| <b>Doc No</b>        |                               |
| <b>Date</b>          | <b>Oct 05, 2018</b>           |



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# Document History

| Date          | Revised Contents         | Revised by | Version         |
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| Mar, 30, 2018 | Create this document.    | JC         | V0.0.2 with GPS |
| May, 25, 2018 | Update for requirements. | JC         | V0.0.3 with GPS |
| Oct, 05, 2018 | Update for requirements. | JC         | V0.0.4 with GPS |



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# 1. LoRaWAN with GPS Code Example

This example shows how to configure the module and all general settings related to LoRaWAN process.

- \* Region : AS923
- \* Device Class : CLASS\_A
- \* Join Method : otaa
- \* ADR : on
- \* Because join by otaa, so need define DevEui, AppEui, AppKey.
- \* TX method : ucnf (confirmed data messages)

In first, MCU 、GPS initialization, LoRaWAN initialization. Second, join the LoRaWAN network by "otaa", when Join finish, every 10s to TX data(=GPS data) to LoRaWAN server. Third, every time to check RX data, if received data, then print.

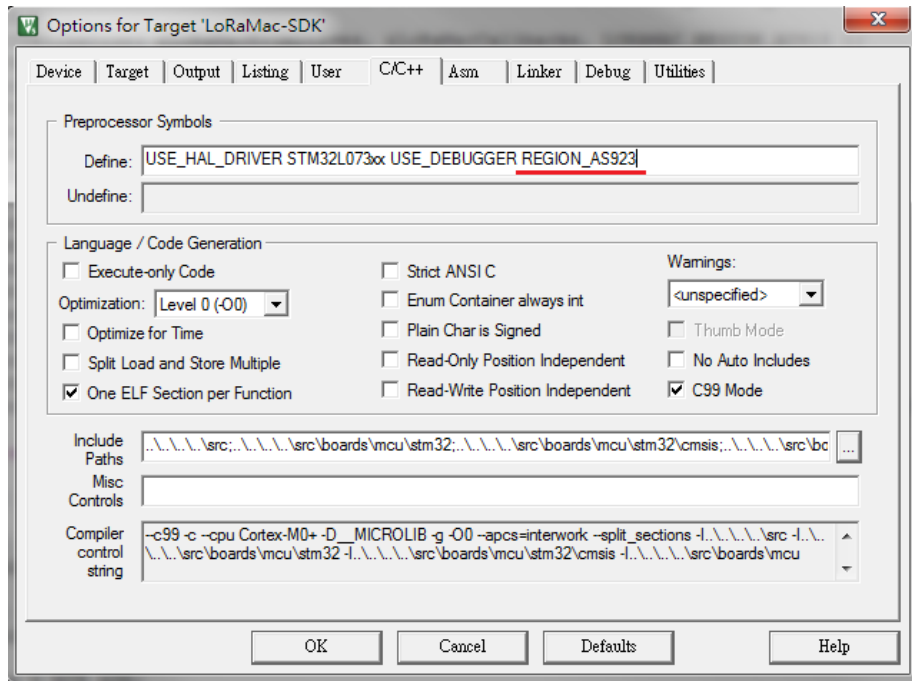
## 2. Regions

LoRaMAC support regions :

- REGION\_AS923 : AS923MHz ISM Band
- REGION\_AU915 : Australia 915-928MHz ISM Band
- REGION\_CN779 : China 779-787MHz ISM Band
- REGION\_EU433 : EU 433MHz ISM Band
- REGION\_CN470 : China 470-510MHz Band
- REGION\_EU868 : EU 863-870MHz ISM Band
- REGION\_IN865 : India 865-867 MHz ISM Band
- REGION\_KR920 : South Korea 920-923MHz ISM Band
- REGION\_US915 : US 902-928MHz ISM Band
- REGION\_US915\_HYBRID : US 902-928MHz HYBRID ISM Band

Example, if want build REGION\_AS923, the setting like this,





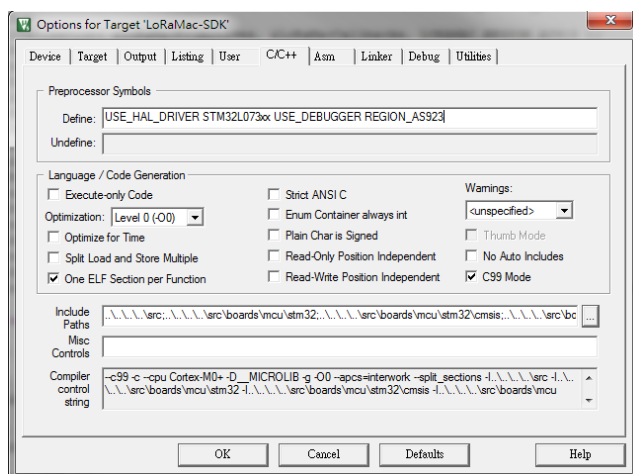
After press “OK” button, and build the Project, the other the region and so forth.

## 3. SX1276/78 : Crystal or TCXO

The S76G、S78G, inside the sx1276 or sx1278 are use Crystal or TCXO. Some are Crystal, some are TCXO. Because here the different, then need setting in “Define” for build

### 3.1 SX1276/78 : Crystal

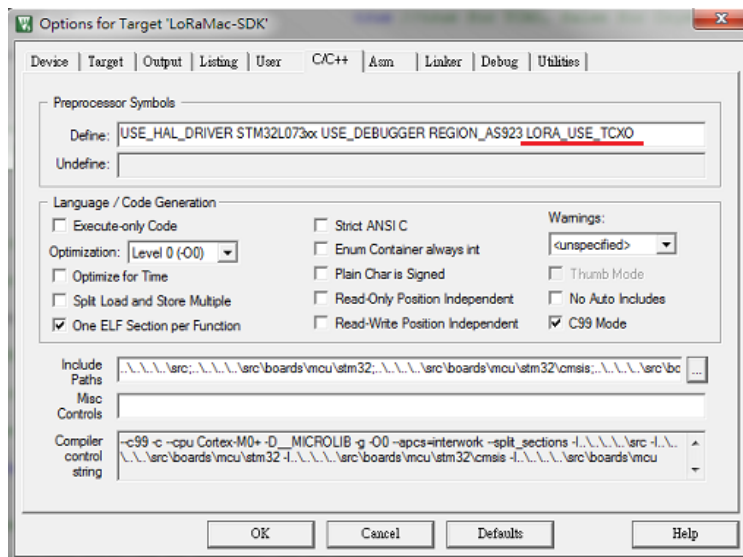
If S76G、S78G, inside the sx1276/78 use the Crystal, then setting like this,



The “Define” don’t need input any define string about crystal. And build it.

### 3.2 SX1276/78 : TCXO

If S76G 、S78G, inside the sx1276/78 use the TCXO, need input the define string “LORA\_USE\_TCXO”, then setting like this,



After press “OK” button, and build the Project.

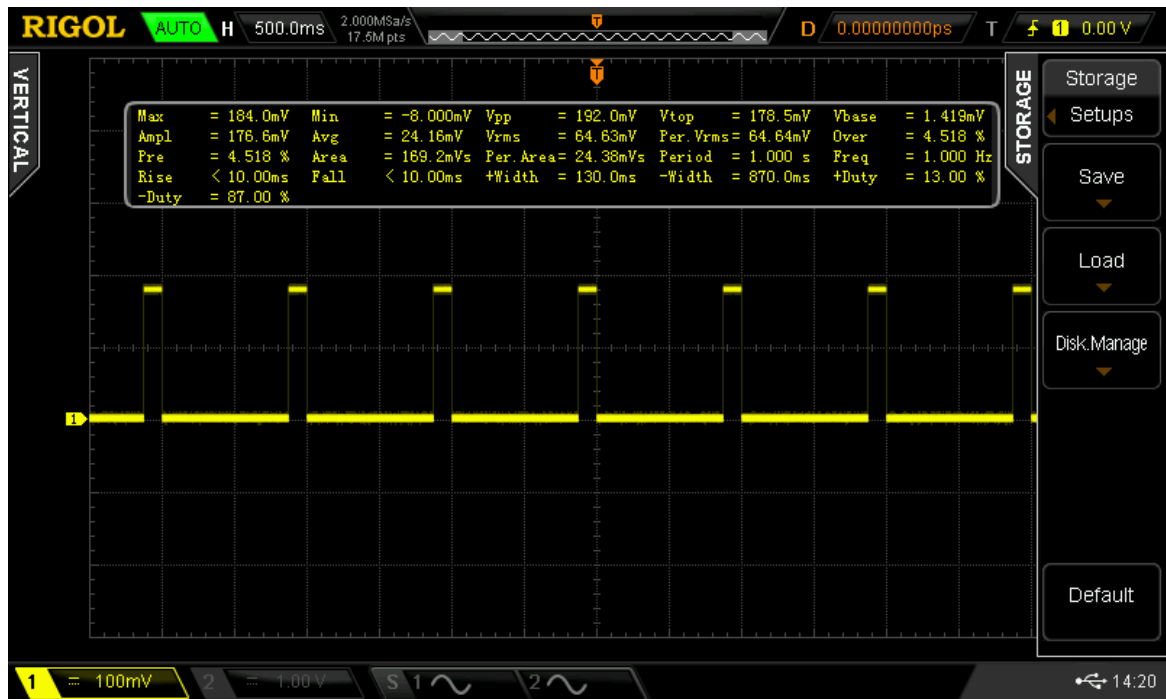
## 4. GPS 1PPS output

If want test the GPS 1PPS output signal, need by “GPS\_1PPS\_OUT” pin.

When GPS 1PPS output is enabled, timing pulse is output in 1 sec period from 1PPS output pin after clock information being received from GNSS. When 1PPS output is disabled, timing pulse is not output from 1PPS output pin.

The GPS 1PPS output:



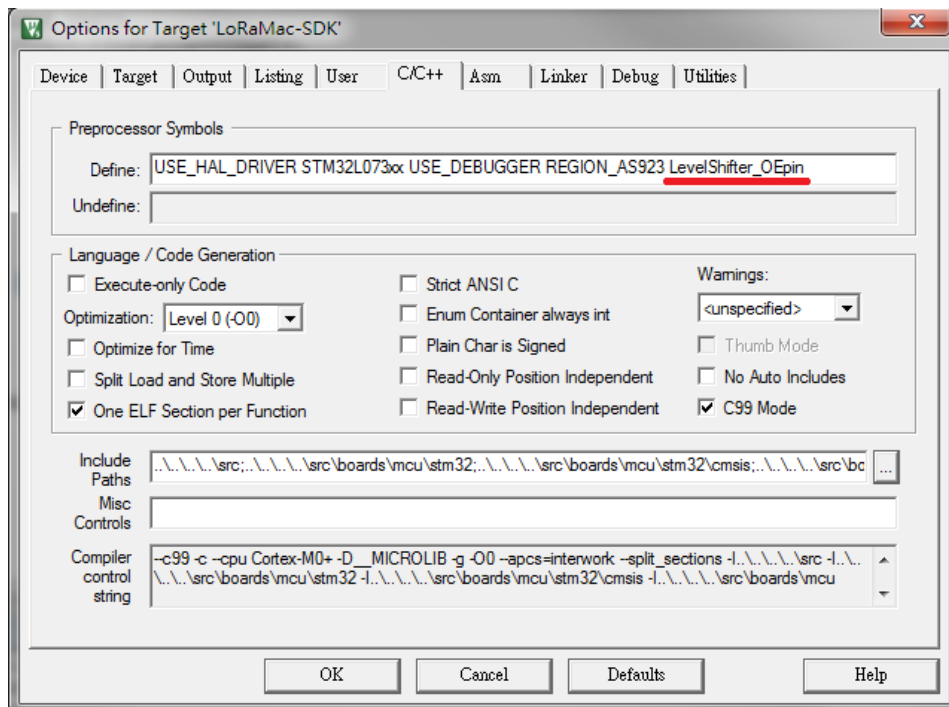


## 5. Level Shifter OE pin control

If the S76G or S78G the circuit version is v2. Need to control the Level Shifter OE pin.

Circuit version is v1 : don't need to control the Level Shifter OE pin.

So if S76G or S78G the circuit version is v2, need to do this: input the define string "LevelShifter\_OEpin", then setting like this,



After press “OK” button, and build the Project.

## 6. GPS Active Low Power Mode

Disable by default. If want to enable, please to open the file “gps\_driver.h”, and setting the key word “GPS\_ActiveLowPowerControlMode” is “1”. Then setting like this,

```

16 #include "board.h"
17 #include "uart-board.h"
18
19 /*!
20 * Enable GPS active low power control mode or Not
21 */
22 #define GPS_ActiveLowPowerControlMode 1 // 1:Enable, 0:Disable
23 #define GPS_ActiveLowPowerMode_DUTYCYCLE 60000 //value in [ms].

```

“GPS\_ActiveLowPowerMode\_DUTYCYCLE” is positioning cycle.

Please refer to the attached file : “SONY CXD5603GF Intro.pdf”, chapter “Operation modes”.





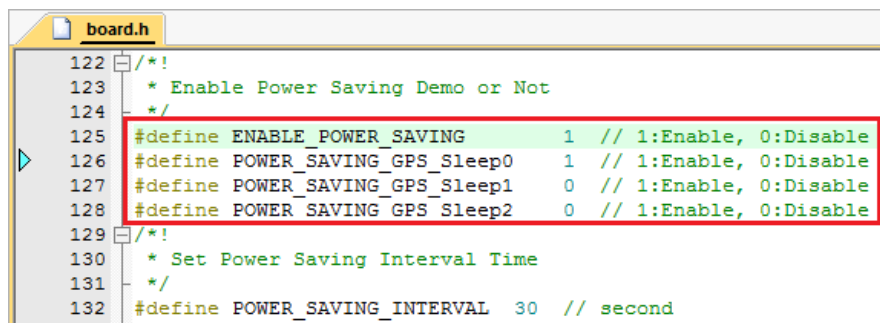
## 7. GPS Sleep

Disable by default. If want to enable, please to open the file “board.h”, and setting the key word “ENABLE\_POWER\_SAVING” is “1”.

And what the GPS sleep level are you want to choice, please to setting to “1”, default is “level 0”.

Please refer to the attached file : “SONY CXD5603GF Intro.pdf”, chapter “Sleep”.

Then setting like this,



```
122 /*!  
123  * Enable Power Saving Demo or Not  
124  */  
125 #define ENABLE_POWER_SAVING 1 // 1:Enable, 0:Disable  
126 #define POWER_SAVING_GPS_Sleep0 1 // 1:Enable, 0:Disable  
127 #define POWER_SAVING_GPS_Sleep1 0 // 1:Enable, 0:Disable  
128 #define POWER_SAVING_GPS_Sleep2 0 // 1:Enable, 0:Disable  
129 /*!  
130  * Set Power Saving Interval Time  
131  */  
132 #define POWER_SAVING_INTERVAL 30 // second
```

