

# MSPM0 real time clock(RTC) module introduction

— MSPM0 peripheral training series

Presented by Cash Hao

# MCU level overview

## —MSPM0Lxx series

### MSPM0L13x3/4/5/6

1.62 - 3.6V  
-40 to 125 C

<b>CPU</b> <b>ARM Cortex-M0+</b> <b>32 MHz</b>	<b>Power &amp; Clocking</b>	<b>Precision Analog</b>
NVIC / 3-ch DMA	POR / BOR / SVS Internal LF 32kHz (5%) Internal HF 4-32MHz (1%)	12-bit SAR ADC 1Msps (1) ULP/HS Comparator (1) 8-bit reference DAC (1) Zero-drift chopper op-amps (2) General purpose amp (1) Internal ADC reference (2.5%) Temperature sensor
<b>On-chip Memory</b>	<b>Communication</b>	<b>Timers</b>
8, 16, 32 or 64 kB flash 2 or 4 kB SRAM	UART w/ LIN (1) UART (1) SPI (1) I2C (2) w/ FastMode+	General purpose 16-bit 2 CC (4) Windowed watchdog
<b>Data Integrity &amp; Security</b>	<b>IO</b>	
CRC accelerator (16 and 32 bit)	Up to 28 GPIO Up to 2 low Ib OPA inputs	
<b>Programming &amp; Debug</b>		
ARM SWD interface ROM UART & I2C BSL		

Leaded packages: SOT-16, VSSOP-20/28  
No-lead packages: WQFN-16, VQFN-24/32

*32 MHz MCU with up to 64kB flash, 32 pins, 12-bit ADC, dual zero-drift OPA/PGA, COMP*

## —MSPM0Gxx series

### MSPM0G350x/310x/150x/110x

1.62 - 3.6V  
-40 to 125 C

<b>CPU</b> <b>Arm Cortex-M0+</b> <b>80 MHz</b>	<b>Power &amp; Clocking</b>	<b>Precision Analog</b>
NVIC / MPU / 7-ch DMA	POR / BOR / SVS External LF 32kHz XTAL External HF 4-48MHz XTAL Internal LF 32kHz (3%) Internal HF 4-32MHz (1%) PLL (up to 80 MHz)	12-bit ADC 4Msps (9-ch) 12-bit ADC 4Msps (8-ch) Comparators w/ 8-bit DACs (3) 12-bit 1Msps buffered DAC (1) Zero-drift chopper op-amps (2) Internal reference (1.5%) General purpose amp (1) Temperature sensor
<b>Accelerators</b>	<b>Communication</b>	<b>Timers</b>
Math (DIV, SQRT, TRIG, MAC)	UART w/ LIN (1) UART (3) SPI (2) I2C (2) w/ FastMode+ CAN-FD (1)	Advanced control 16-bit 4 CC (1) Advanced control 16-bit 2 CC (1) General purpose 32-bit 2 CC (1) General purpose 16-bit 2 CC (2) Low power 16-bit 2 CC (2) Windowed watchdog (2) <b>Real-time clock (1)</b>
<b>On-chip Memory</b>	<b>IO</b>	
32, 64, or 128 kB flash [ECC] 16 or 32 kB SRAM [ECC]	Up to 60 GPIO	
<b>Data Integrity &amp; Security</b>		
CRC accelerator (16 and 32 bit) AES256 accelerator + TRNG		
<b>Programming &amp; Debug</b>		
ARM SWD interface UART & I2C bootloader		

Leaded packages: VSSOP-20/28, LQFP-48/64  
No-lead packages: VQFN-24/32/48, nFBGA-64, WCSP-28

*80 MHz MCU with up to 128kB flash, 64 pins, advanced analog, AES/TRNG, CAN-FD*

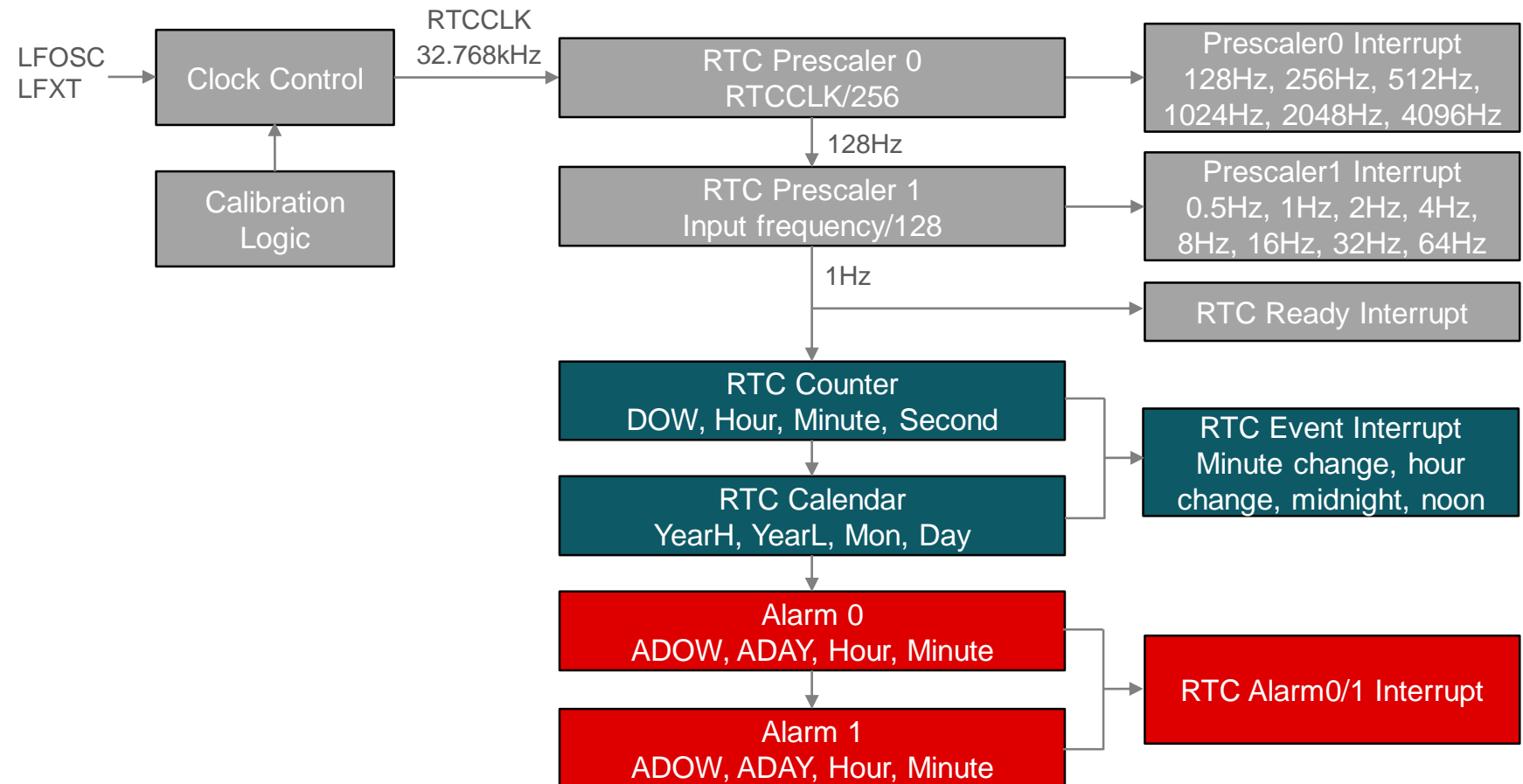
# MSPM0G350x RTC module introduction

## Key Features

- Real-time clock and calendar mode providing seconds, minutes, hours, day of week, day of month, and year
- Selectable binary or **BCD format**
- **Leap-year correction**(valid for year 1901 through 2099)
- **Two** customizable calendar alarm interrupts
- Interrupt capability down to STANDBY mode
- Calibration for crystal offset error and crystal temperature drift(up to **±240ppm** total)

## Key Differences between G and L MCUs

- MSPM0G350x MCUs have **1 RTC module**



# Clock module quick start

## Academy

[RTC introduction lab](#)

## Driverlib Examples

### MSPM0G350x:

- rtc\_calendar\_alarm\_standby
- rtc\_offset\_calibration\_lfxt
- rtc\_periodic\_alarm\_lfosc\_standby
- rtc\_periodic\_alarm\_lfxt\_standby

## Related Links

[MSPM0 online resource](#)

[MSPM0 Quick start guide](#)

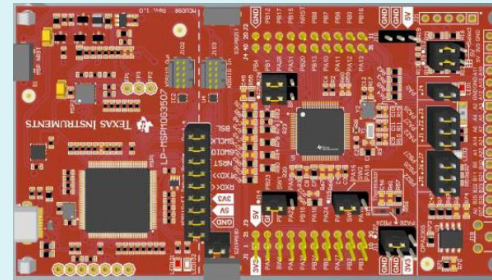
[MSPM0 Sysconfig user's guide](#)

[MSPM0G350x datasheet](#)

[MSPM0Gxx technical reference manual](#)

## Launchpad

### LP-MSPM0G3507



## Sysconfig Entrance for RTC Setting

**MSPM0 DRIVER LIBRARY (7)**

- SYSTEM (8)
  - Board 1/1 ✓ +
  - DMA +
  - GPIO **Step 1: 1 ✓ +**
  - MATHACI +
  - RTC 1/1 ✓ +**
  - SYSCTL 1/1 ✓ +
  - SYSTICK +
  - WWDT +
- ANALOG (5)

**RTC** ⊕

+ ADD REMOVE ALL

Quick Profiles ▾

RTC Profiles **Step 2: Custom** ▾

**Basic Configuration** ▾

RTC format Binary ▾

RTC Calendar Date 10:32:58 (HH:MM:SS) April 5, Monday, 2021

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- [Ti.com.cn](http://ti.com.cn)
- [WeChat \(德州仪器公众号\)](#)
- [Bilibili](#)
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