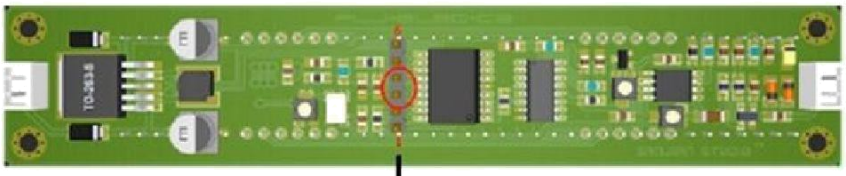
# RF Signal Frequency Counter

## 0.1-60MHz, 20MHz ~ 2.4GHz

Programming interface ICSP definition:

| 脚位 | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| 定义 | VPP | 5V | GND | PGD/中频切换 | PGC | AUX |

System reset

Long press SET key

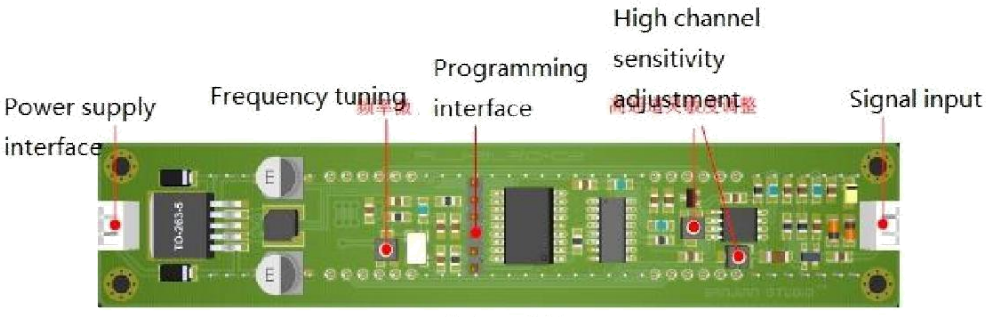
Shutdown state → Put through power supply

Loosen the SET key

XXXX.XX.XX → Reset to complete

Display product version


PCB 正面（3D 视图）




PCB 背面（3D 视图）

**1. Description:**

- With Microchip's PIC16F648A, 2.4 GHz frequency meter.
- Using temperature-compensated voltage controlled crystal oscillator (2.5 ppm VC-TCXO).
- Unique gate control and precise time algorithm (non-timed interrupt).
- Gate (display refresh) time 0.01 seconds / 0.1 seconds / 1.0 seconds, real-time display frequency value.
- Single-ended input design, three-channel frequency measurement (low channel / high channel / Auto Channel).
- Dual frequency design, value and IF / down mode can be preset separately.
- Using eight 0.56 inches high brightness digital display, eight adjustable brightness.
- Circuit is simple and reasonable structure, two-button control, simple operation.
- The settings are automatically saved, boot directly call.
- Gate Times
  - 1 second
  - 0.10 second

**2. Measurement channels (channels are low impedance)**

Low channel

- Measuring range: 0.1 MHz ~ 60 MHz
- Accuracy: ± 100Hz (0.01 1s gate time)
- ± 10Hz (0.1 seconds gate)
- ± 1Hz (1.0 seconds when the gate)
- Low channel sensitivity:
  - MHz ~ 10 MHz: better than 60mVPP
- 10 MHz ~ 60 MHz: better than 60mVPP
- 60 MHz ~ 75 MHz: Not tested

High channel (divided by 64)

- Measuring range: 20 MHz ~ 2.4 GHz
- Accuracy: ± 6400Hz (0.01 seconds gate)
- ± 640Hz (0.1 1s gate time)
- ± 64Hz (1.0 1s gate time)

High channel sensitivity:

- 20 MHz ~ 30 MHz: better than 100mVPP
- 30 MHz ~ 60 MHz: better than 50mVPP
- 60 MHz ~ 2.4GHz: not tested

Auto Channel

Automatically selected according to the input signal frequency high or low channel channel, identifying the frequency of 60 MHz. Such as when the input signal amplitude is greater than 60 MHz shortage cannot automatically select high channel, the channel should manually select high frequency measurement.

**3. IF settings**

Independent double-IF design, adjust the minimum frequency step of 100 Hz, frequency range 0 ~ 99.9999 MHz, can be set to increase or decrease the IF frequency mode.

**4. Frequency reference**

- Using 5032 package 13.000MHz Warming voltage controlled crystal oscillator (VC-TCXO), frequency stability of ± 2.5 ppm.

**5. Operating voltage**

- DC Input: DC 9V ~ 15V (with reverse polarity protection)

**6. Current**

- Maximum 160 mA (test conditions: ① DC12V power supply; ② red LED; ③ eight brightness)

**7. Eight LED display, the highest display eight digits.**

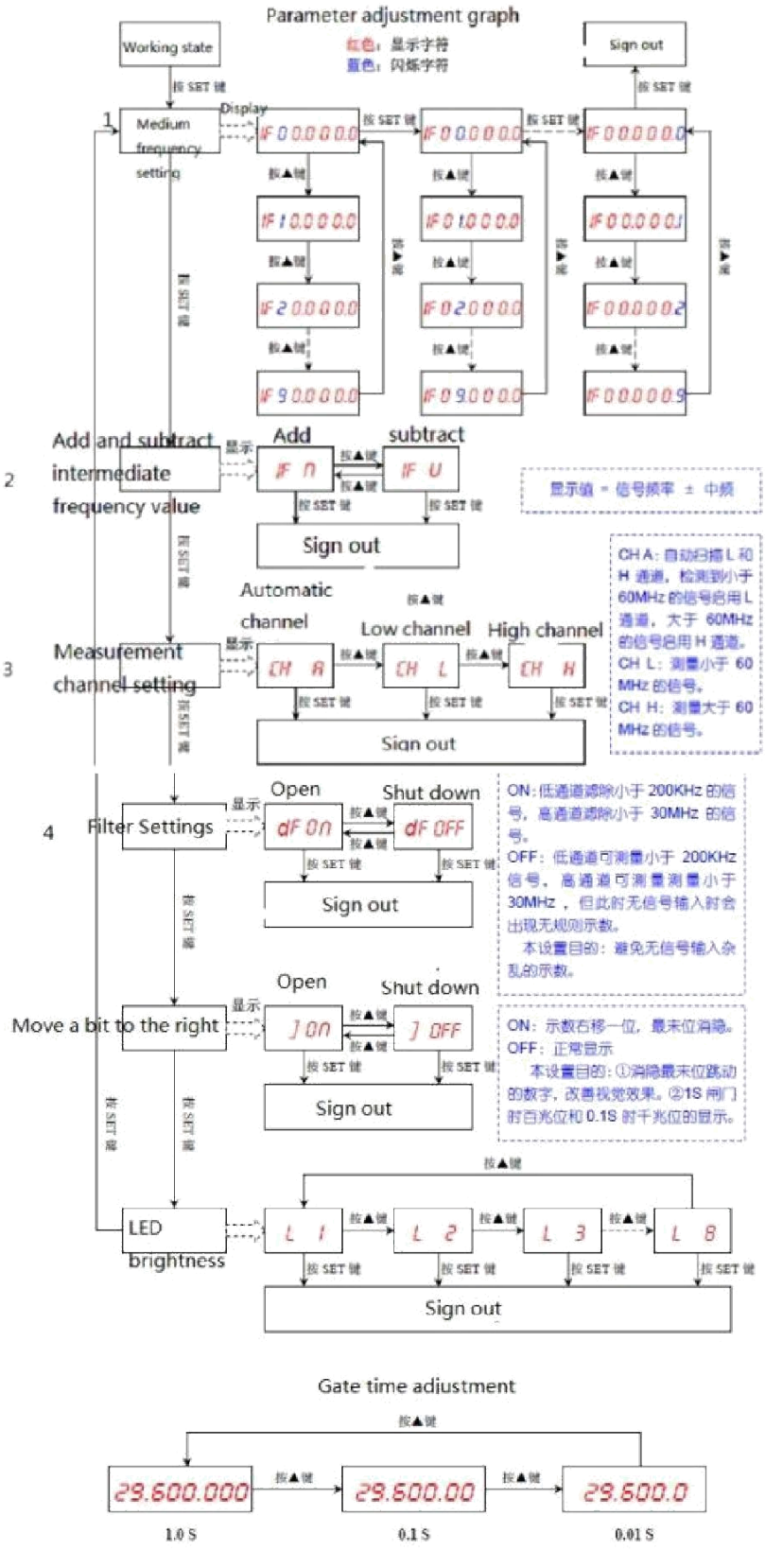
**8. Eight LED brightness is adjustable, factory set to maximum brightness.**

**9. Physical Dimensions, Length × width × height: 125.5 mm × 25.5 mm × 21.5 mm**

**10. Component quality 46 g (NW)**

**11. Onboard Interface**

- DC IN (Power Interface): HX2.54-2P socket
- RF IN (signal input): HX2.54-2P socket
- ICSP (programming interface): 2.54-6P Pin


Parameter adjustment graph
红色：显示字符
蓝色：闪烁字符
Working state
Sign out
按 SET 键
1
Medium frequency setting
Display
按▲键
2
Add and subtract intermediate frequency value
Add
subtract
显示值 = 信号频率 ± 中频
3
Measurement channel setting
Automatic channel
Low channel
High channel
CH A：自动扫描 L 和 H 通道，检测到小于 60MHz 的信号启用 L 通道，大于 60MHz 的信号启用 H 通道。
CH L：测量小于 60 MHz 的信号。
CH H：测量大于 60 MHz 的信号。
4
Filter Settings
Open
Shut down
ON：低通道滤除小于 200KHz 的信号，高通道滤除小于 30MHz 的信号。
OFF：低通道可测量小于 200KHz 信号，高通道可测量测量小于 30MHz，但此时无信号输入时会出现无规则示数。
本设置目的：避免无信号输入杂乱的示数。
Move a bit to the right
ON：示数右移一位，最末位消隐。
OFF：正常显示
本设置目的：①消隐最末位跳动的数字，改善视觉效果。②1S 闸门时百兆位和 0.1S 时千兆位的显示。
LED brightness
Gate time adiustment
29.600.000
29.600.00
29.600.0
1.0 S
0.1 S
0.01 S

# N2APB Notes:

**Lower PB: "Gate Time Adjustment"**

- Tap: Display to 1 Hz (29,600.000 kHz) [1s gate time]
- Tap: Display to 10 Hz (29,600.00 kHz) [0.1s gate time]
- Tap: Display to 100 Hz (29,600.0 kHz) [0.01s gate time]

**Top PB: "MODE"**

- **Set IF: Sets IF offset frequency**
  - Lower PB increase selected (blinking) digit
    - ♣ If Lower PB pressed again, exit to next Mode ○

    Upper PB moves selected (blinking) digit
    - ♣ Pushing PB fully to the right completes the entry
  - Note 1: To set digits other than 10 MHz, the 10M digit must be changed first in order to select other digits.
  - Note 2: To decrease a digit, just keep incrementing until number cycles back to desired value)

- **IF Direction**
  - Lower PB toggles between U and N
    - ♣ U: "Up" (Add IF offset)
    - ♣ N: "DowN" (Subtracts IF offset)
  - Upper PB to exit

- **CH … Measurement Channel Selection**
  - Lower PB changes between Low, High and Auto
    - ♣ L: Low Frequency Range (0.1 MHz - 60 MHz)
    - ♣ H: High Frequency Range (20 MHz – 2.4 GHz)
    - ♣ A: Auto Frequency Ranging
  - Upper PB to exit

- **DF… Filter** ***[Unknown!]***
  - Lower PB toggles between ON and OFF
    - ♣ ON: "Open" … Display is 00.000.000 when no input is applied(?)
    - ♣ OFF: "Shutdown" … Random "noisy" display shows when no signal applied(?)

- **L … LED Intensity Setting**
  - Lower PB increments the intensity setting from 1 (lowest) to 8 (highest).
  - Upper PB to exit