

Customer Code:

DATASHEET

DAPU P/N: **CM66K-D129-10.00MHz**

Customer P/N: _____

| DAPU | | | Customer Approval |
|------------------|---------|----------|------------------------|
| Drew | Audited | Approved | |
| | | | |
| Date: 2020.01.07 | | | |
| | | | Stamp, please! Thanks! |

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1. General Description

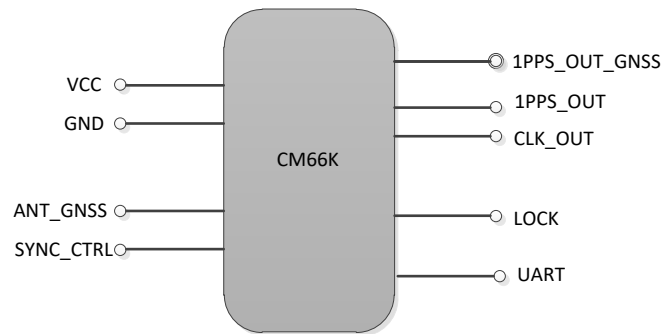


Figure 1 CM66K

Figure 1 is the basic diagram of CM66K. CM66K is a high-performance clock module designed to provide precise frequency and phase synchronizing with internal time reference for telecom and other applications.

Key features:

- **Reference:** GNSS receiver
- **Temperature Stability:** ± 0.2 ppb;
- **Holdover:** $\pm 1.5\mu\text{s}/24\text{h}$ @ $\Delta T = \pm 5^\circ\text{C}$;
- **Clocks Output:** 2*1PPS output and 1*10MHz output;
- **Serial Interface:** 1*UART for TOD and management;
- **Mechanical Size:** 60mm*60mm*13mm.



2. Pin Definition

Table 1 Pin Definition

| Pin group | Pin# | Pin Name | Type | Description |
|-------------------------|-----------------|---------------|------|--|
| Supply Voltage | 4, 9, 11, 13 | GND | GND | Ground |
| | 12 | VCC | PWR | Power Supply |
| Control and Status Pins | 8 | SYNC_CT RL | I | Synchronizing Procedure Control |
| | 5 | LOCK | O | Lock Status |
| UART | 6 | RXD0 | I | Asynchronous Serial Data Output/Input. 9600-N-8-1 |
| | 7 | TXD0 | O | |
| GNSS | 10 | 1PPS_OUT | O | 1PPS Output from the internal GNSS receiver. |
| | SMA-KE | ANT | I | GNSS ANT signal input |
| Output Clocks | 3 | 1PPS_OUT | O | 1PPS Output |
| | 2 | CLK_OUT | O | 10.00MHz Output |
| Reserve | 1, 14 | NC | | Not connected. |

3. Electrical Parameters

Table 2 Electrical Parameters

| Parameter | Symbol | Minimum | Typical | Maximum | Units |
|---------------------------|----------|---------|---------|---------|-------|
| LVC MOS Input | | | | | |
| High Level Input Voltage | V_{IH} | 2.7 | | | V |
| Low Level Input Voltage | V_{IL} | | | 0.4 | V |
| LVC MOS Output | | | | | |
| High Level Output Voltage | V_{OH} | 2.7 | | | V |
| Low Level Output Voltage | V_{OL} | | | 0.4 | V |



4. Performance

Table 3 Performance

| Item | Parameter | Minimum | Typical | Maximum | Units | Test Condition | |
|-----------------------------------|---------------------------|---|---------|---------|-------------------|--|-----------------------|
| Internal Receiver Characteristics | Number of Channels | | | 50 | | | |
| | Frequency Band | BD2 B1(1561.098MHz) L1 (1575.42 MHz) | | | | | |
| | Tracking Code | | | | | C/A Code | |
| | Tracking Capability | | | 12 | | 12 Satellites | |
| | Sensitivity | | | -159 | | dBm | Tracking & Navigation |
| | | | | -144 | | dBm | Acquisition |
| Clock Output | Nominal Frequency | 10.00 | | | MHz | Synchronizing with GNSS 1PPS output. | |
| | Duty Cycle | 45 | 50 | 55 | % | Load 15pF | |
| | Frequency vs. Temperature | -0.2 | | +0.2 | $\times 10^{-9}$ | V _{cc} =5.0V; O _{load} =15pF; T _A varies from -40°C to 85°C, temperature slope less than °C per minute. | |
| | Accuracy | -1 | | +1 | $\times 10^{-12}$ | 24 hours average value when locked to 1PPS. | |
| | Short-term Stability | -0.02 | | +0.02 | $\times 10^{-9}$ | V _{cc} =5.0V; T _A =25°C; 1s; using PN9000; no EMI/EMC or other interference. | |
| | Daily Aging | -0.2 | | +0.2 | $\times 10^{-9}$ | V _{cc} =5.0V; T _A =25°C. FREE RUN condition and after 30 days of operation. | |
| | Yearly Aging | -0.01 | | +0.01 | $\times 10^{-6}$ | | |
| | Phase Noise | | | -118 | -113 | dBc/Hz | 10Hz |
| | | | | -138 | -133 | | 100Hz |
| | | | | -148 | -143 | | 1KHz |
| | | | -150 | -145 | 10KHz | | |
| | | | -150 | -145 | 100KHz | | |
| | | | -150 | -150 | 1MHz | | |



| | | | | | | |
|----------------|-------------------|------|-----|------|---------|--|
| 1 PPS Output | Pulse Width | | 100 | | ms | |
| | Accuracy | -20 | | +20 | ns | Synchronizing with 1PPS reference. Mean is 0, and standard deviation is 20ns. After locking, monitor 24 hours. |
| | 24 hours holdover | -1.5 | | +1.5 | μ s | $\Delta T = \pm 5^{\circ}\text{C}$, 24 hours holdover after turn on 7days and GPS lock 3days. Temperature variable speed less than 1°C per minute |
| | | | | | | |
| Supply Voltage | Supply Voltage | 4.75 | 5.0 | 5.25 | V | |
| | Warm Up Current | | | 2000 | mA | During Warm-up |
| | Steady Current | | | 1000 | mA | During steady state operation @25°C |
| | AC Ripple | | | 50 | mVpk-pk | 10Hz to 1MHz |

5. UART

UART interfaces are used for management and TOD, which has a fixed baud rate (9600) using 1 stop bit and no parity. It is a LVTTTL-compatible port and needs an external translator to work with other signal types (such as RS-232C or RS-485).

6. Control and Status Pins

CM66K is a clock module which synchronizes the local clock to reference such as 1 PPS retrieving from GNSS. CM66K will work normally performing synchronizing algorithm when the SYNC_CTRL pin is driven high. It also could be force to work in free-run or holdover status when the SYNC_CTRL pin is driven low.

The LOCK pin indicates the lock status of CM66K. High level indicates the module is locked to GNSS reference. When the module never is locked to reference after power up, the status of module is free-run, the LOCK pin outputs low. When the GNSS signal is lost, the status of module is holdover, the LOCK pin also output low.



7. Environmental Conditions

Table 4 Environmental Conditions

| Parameter | Conditions | |
|----------------------------|--|----------------------|
| Operating Temperature | -40°C to 85°C | |
| Storage Temperature | -55°C to 105°C | |
| Storage Humidity | 30%~80% | |
| ESD Level | Human Body Model, class2: 2000V to 4000V; ANSI/ESDA/JEDEC JS-001-2010. | |
| | Machine Model, class B: 200V to 400V; ANSI/ESDA/JEDEC JS-001-2010. | |
| Moisture Sensitivity Level | Not humidity sensitive. | |
| Vibration | Test Condition: 0.75mm ;acceleration:10g;10Hz~500Hz, one cycle per 30 min, test 2 hour. (3 times for each 3 directions X ,Y , Z), IEC 68-2-06 Test Fc. | |
| Shock | 50g; 11ms; half sine wave (3 times for each 3 directions X,Y,Z),IEC 68-2-27 Test Ea/Severity 50A. | |
| Relative Humidity | 20% ~70% | Full Package Storage |
| Temperature | -10°C~35°C | |

8. Typical Application

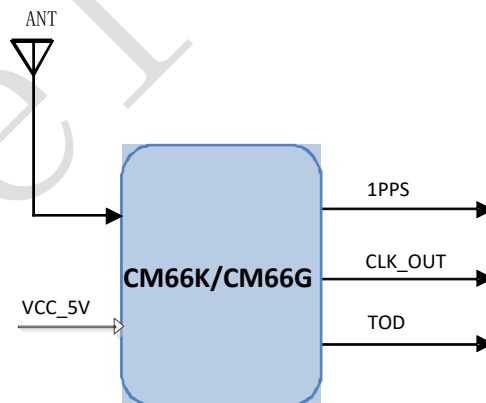


Figure 2 Typical application

GNSS Receiver is embedded in CM66K.



9. Mechanical Structure (mm)

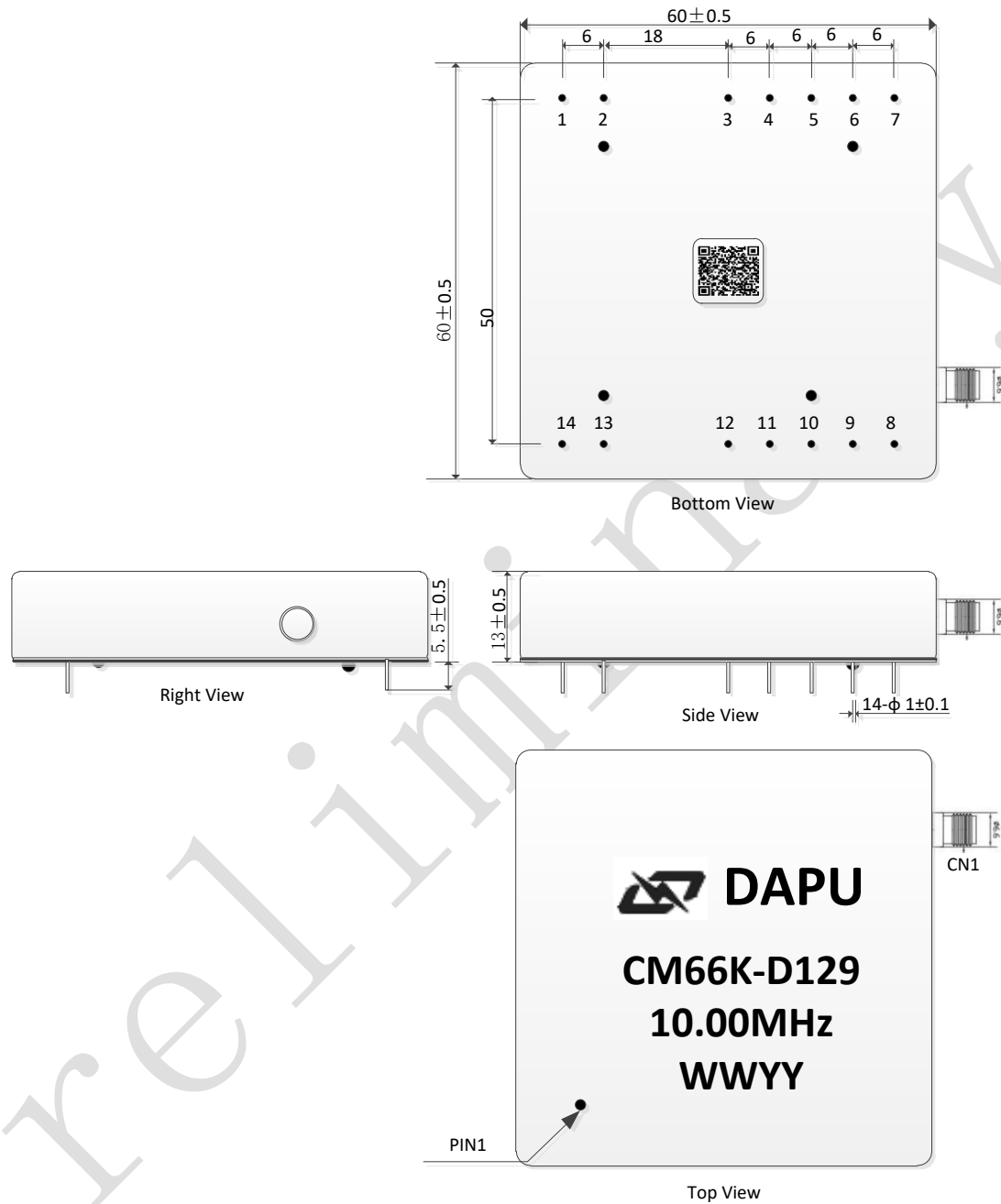


Figure 3 Mechanical structure

Note1: Tolerance ± 0.2 mm without mark.

Note2: WW represents Week.

YY represents Year.

Note3: Referential Weight 82 ± 10 g



10. Wave Soldering Curve (RoHS)

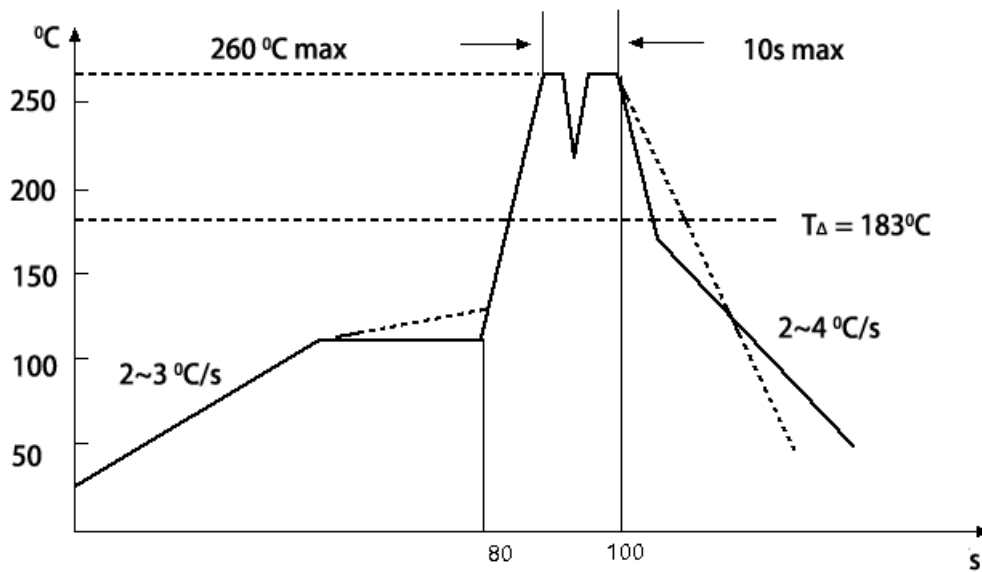


Figure 4 Wave soldering curve

11. Package (mm)

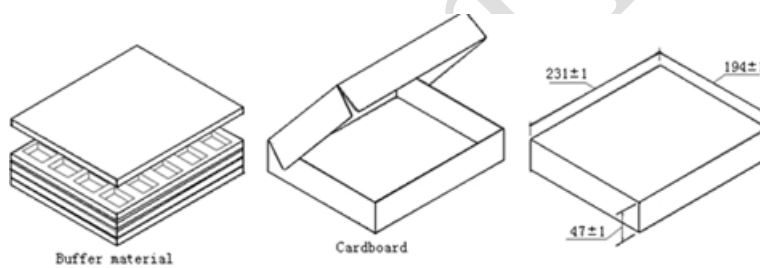


Figure 5 Package

Note: Max 4pcs.