



Product Portfolio

Clock modules, OCXO, TCXO, VCXO, Circulator, RTC, Buffer, 1588 chipsets...

2020Q3

Company Profile



- Founded in 2005.
- As a modern mobile communication solution and device supplier integrating R&D, manufacturing and sales, DAPU is a national high-tech enterprise and a leader in time-frequency subdivision industry.
- DAPU focuses on the R&D and promotion of products with clock, RF, microwave and sensor core technologies, and provides integrated solutions from chips and modules to products. We can fully satisfy the differentiated needs of customers in the fields of global communication network, power, industrial control, private network, medical treatment and automobile electronics.
- DAPU has national CNAS lab, Joint Lab of Chinese Academy of Sciences, Joint Lab of materials of Tsinghua University, Joint Lab of 5G core chips of HKUST and other key labs and engineering research centers. With strong R&D strength, DAPU has been the member of ITU-T and other standard organizations. We continue to invest a high proportion in new technology introduction, basic research and product R&D innovation, to ensure continuous leading and breakthrough in key fields of compensation algorithm, clock technology, RF technology, material technology and chip design.
- DAPU serves major domestic and overseas communication equipment suppliers with high recognized and trusted by global communication enterprises.



600+ staff



>25%
R&D staff



Four
subsidiaries



>15%
R&D
Investment



The best
outsourcing
factory

Sync with you!

Product Map



Sync with you!

Product Portfolio



Crystal Oscillator

TCXO, MCXO, OCXO, VCXO
High Stability, Small size



Circulator & Isolator

Low Insertion Loss
Low IMD
Great Impedance matching



Clock Module

Integrated GPS
Support IEEE1588V2
Holdover: $\pm 1.5\mu\text{s}/24\text{ hrs}$



1588 Chip

Better Algorithm
Most integrated one chip
1588 solution



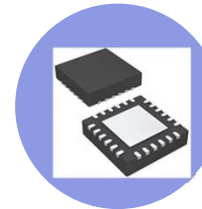
Timing Card

Plug and Play Solution
High Integrated



Buffer

High performance
Low-jitter, low power
consumption clock fanout



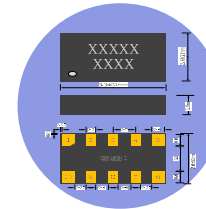
Timing Device

High precision time source
Support GNSS, IEEE1588V2



RTC

Ultra-low power consumption
High Stability
Wide Operating temp



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PART 01

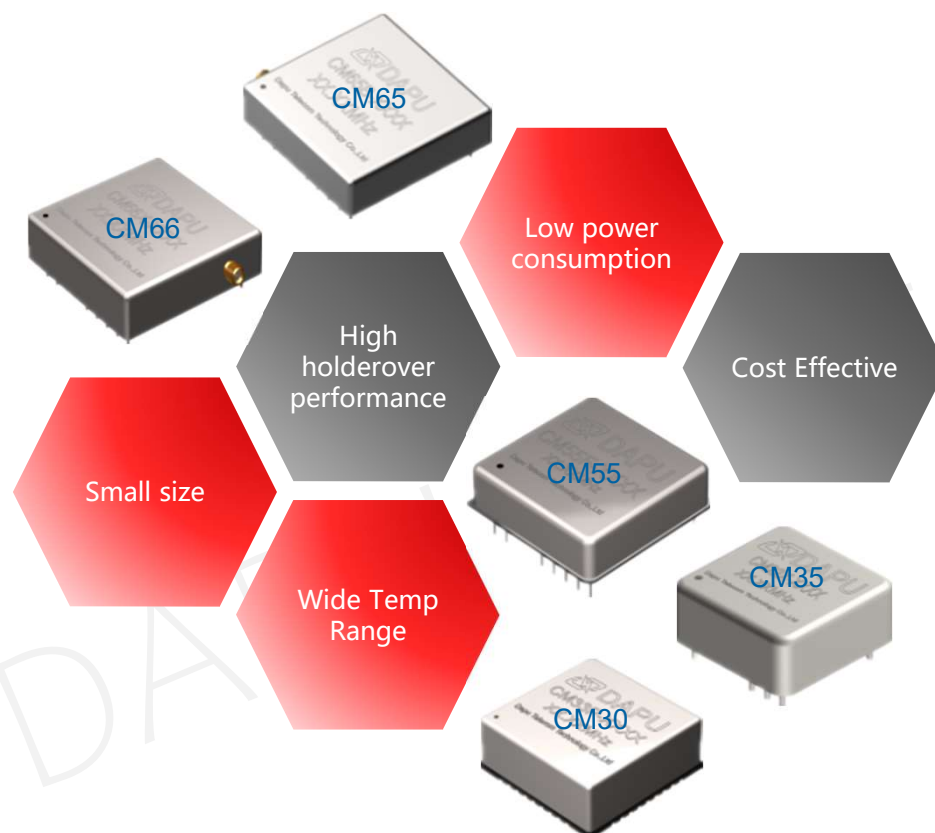
Clock Module

Sync with you!

Solutions of Stratum 1 clock

- Holdover requirements of Stratum 1 clock: When higher stability clock is lost, holdover capability should be better than $\pm 1.5\mu\text{S}/24\text{H}$;
- ✓ When $\pm 1.5\mu\text{S}/24\text{H}$ is converted to the frequency of crystal at free run state, requirement of frequency tolerance is :
 $1.5\mu\text{S}/(24 \times 3600 \times 10^6 \text{uS}) \approx 1.74\text{E}-11$;
- Main factors that lead to the above crystal drift are: crystal day aging drift and temperature stability drift.
- Dapu promoted CM series including CM65(1pps reference), CM66(GPS/Compass receiver), CM55(13mm height), R55 according to the requirements of Stratum 1 Clock standards.

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Holdover Performance

- CM66--holdover $\pm 1.5\mu\text{s}@24 \text{ hours } (\Delta T \pm 10^\circ\text{C})$
- CM65--holdover $\pm 1.5\mu\text{s}@24 \text{ hours } (\Delta T \pm 30^\circ\text{C})$
- CM55--holdover $\pm 1.5\mu\text{s}@24 \text{ hours } (\Delta T \pm 10^\circ\text{C})$
- CM35--holdover $\pm 1.5\mu\text{s}@8 \text{ hours } (\Delta T \pm 10^\circ\text{C})$
- CM30--holdover $\pm 1.5\mu\text{s}@8 \text{ hours } (\Delta T \pm 5^\circ\text{C})$

Ultra Low Phase Noise

- CM66: $-145\text{dBc/Hz (100Hz); -155dBc/Hz (1kHz)}$
- CM65: $-140\text{dBc/Hz (100Hz); -150dBc/Hz (1kHz)}$
- CM30: $-145\text{dBc/Hz (100Hz); -155dBc/Hz (1kHz)}$

High Integrated, significant board space and system cost saving

- Support GPS/GLONASS/BEIDOU/GALILEO 1PPS
- Inside OCXO integrated
- With Compensation Algorithm
- UART, SPI Slot

Sync with you!

Clock Module

CM65 (Wide Temperature Tolerance, High Holdover Capability Clock Module)

- Operating Voltage: 5.0V
- Power Consumption: Warm-up 10W, Stable 4.0W
- ✓ Holdover Capability: $\pm 1.5\mu\text{S}/24\text{H}$ ($\Delta T = \pm 30^\circ\text{C}$)
- PKG: DIP 65X65X18.0mm
- Phase Noise: @10MHz

-120dBc/Hz	10Hz
-140dBc/Hz	100Hz
-150dBc/Hz	1KHz
-152dBc/Hz	10KHz
-155dBc/Hz	100KHz
-155dBc/Hz	1MHz



Wide Temperature Tolerance
High Holdover Capability

- Application: Base Station, Clock Source, Clock Server

Sync with you!

Clock Module

CM30 (Fast Stabilized, Smaller Size Clock Module)

The CM30 is a high-performance clock module designed to provide precise frequency, phase and TOD synchronization with external time reference for telecom and other applications

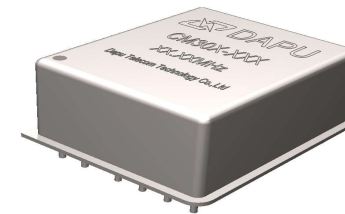
Features:

- Reference: 1PPS and TOD from GNSS receiver, IEEE 1588 etc.
- Frequency: 10MHz
- Temperature Stability: $\pm 0.2\text{ppb}$ ($-40^{\circ}\text{C} \sim +70^{\circ}\text{C}$)
- Holdover: $1.5\mu\text{s}/8\text{ hrs}$ ($\Delta T = \pm 10^{\circ}\text{C}$)
- Short-term Stability: $\pm 1.0 \times 10^{-11}$
- Time Accuracy: $\pm 5.0 \times 10^{-12}$ after 24hrs when locked to 1PPS
- Phase alignment: $\pm 50\text{ns}$ when aligned to 1PPS
- Clocks Input/Output: 1*1PPS input, 1*1PPS output and 1*10MHz output
- Serial Interface: 1*UART for TOD, 1*1UART for management
- Management Interface: UART
- Aging : $\pm 0.5\text{ppb}/\text{day}$, $\pm 0.03\text{ppm}/\text{year}$
- Phase Noise: $-150\text{dBc}/\text{Hz}@1\text{KHz}$

Application: Power grid, clock reference, base station, high precision server, IP Backhaul etc.

Operating Temperature: $-40^{\circ}\text{C} \sim +75^{\circ}\text{C}$

Package size: SMD 30.0*25.0*15.0mm



**Smaller Size
Cost Effective solution**

Sync with you!

Clock Module

CM66 (Clock Module with GPS/Compass receiver)

- Operating Voltage: 5.0V
- Power Consumption: Warm-up 10W, Stable 5.0W
- ✓ Holdover Capability: $\pm 1.5\mu\text{S}/24\text{H}$ ($\Delta T = \pm 10^\circ\text{C}$)
- ✓ Dual Module : Internal GPS / Dual Module Receiver
- PKG: DIP 60X60X13.0mm
- Phase Noise: @10MHz

-120dBc/Hz	10Hz
-140dBc/Hz	100Hz
-150dBc/Hz	1KHz
-152dBc/Hz	10KHz
-155dBc/Hz	100KHz
-155dBc/Hz	1MHz



**High Holdover Capability
with GPS Receiver**

- Application: Base Station, Clock Source, Clock Server

Sync with you!

Clock Module

CM35 (IEEE 1588v2 supported Clock Module)

The CM35 is a high-performance clock module designed to provide precise frequency, phase and TOD synchronization information for telecom and other applications. The module supports PTP Grandmaster, PTP Slave and BC mode.

Features :

- Support **PTP Grandmaster, PTP Slave, BC mode**
- Time aligned output pair: 1PPS and 125MHz divided by n(n=4 to 125000)
- Frequency aligned output: 1Hz and programmable frequency 1KHz to 62.5MHz
- Holdover: **1.5 μ s/8 hrs ($\Delta T = \pm 10^{\circ}\text{C}$)**
- Recovery Precision: $\pm 50\text{ns}$ after 24hrs
- Support ITU Profile: G.8265.1, G.8275.1, G.8275.2
- Clock: 3 clock inputs and 4 clock outputs
- Port: 2xSGMII and 2xUART(1xTOD)
- Management Interface: UART

Application: Power grid, clock reference, base station, high precision server, IP Backhaul etc.

Operating Temperature: $-20^{\circ}\text{C} \sim +75^{\circ}\text{C}$

Package size: SMD 40.0*35.0*13.0mm



**Module design for
IEEE 1588**

Sync with you!

Timing Device - DP3000E



Description:

- The DP3000E is a high-performance Grand Master device designed to provide precise frequency, phase and time-of-day synchronization information for LTE/LTE-A networks and other applications. The device is IEEE 1588-2008 (1588V2) standard compliant and uses GNSS satellite signal as a primary time reference.

Features:

- High-precision clock synchronization
- GNSS timing source
- Full support of IEEE1588V2
- One-step/two-step support
- G.8261, G.8263, G.8265.1/2 , G.8272, G.8275.1 compliant
- Synchronous Ethernet per ITU-T G.8262, G.8264
- Dimensions : 250 mm (H) x 190 mm (W) x 93 mm (D).
- Ingress Protection:IP66
- SFP support
- Network capacity: 500 slave clocks at the rate of 16 packets/s
- The performance of the synchronous Ethernet signal:
 - Frequency accuracy: ± 0.5 ppb @ 24 hours
 - Holdover accuracy: ± 1 ppb @ 24 hours



Performance:

- The performance of the time signal using IEEE 1588 PTP:
 - ✓ Track accuracy: ± 20 ns (compared to UTC)
 - ✓ Holdover : ± 1.0 μ s @ 24 hours, $\Delta T = \pm 30^{\circ}\text{C}$

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PART 02

OCXO

Sync with you!

Solutions of Stratum 2 clock

- Requirement of Stratum 2 clock standard: holdover stability should be better than $\pm 1.0E-10/\text{day}$;
- Main factors caused the above drift are crystal day aging drift and temperature stability drift.
- Dapu promotes O22B and O23B series according to the requirements of Stratum 2 clock standards.

Solutions of Stratum 3E clock

- ✓ 2 classifications according to stratum 3E clock holdover specification:
 1. When temperature is varying, overall drift is better than $\pm 1.0E-8/24H$;
 2. When temperature is varying, overall drift is better than $\pm 1.0E-8/24H$; When temperature dose not change, overall drift is better than $\pm 1.0E-9/24H$;
- Main factors that affect the above frequency drift are crystal day aging drift and temperature stability drift.
- According to the required solutions of stratum 3E clock, Dapu promotes:
 1. O11F series that meet the clock specification $\pm 1.0E-8/24H@(-40\sim 105^{\circ}C)$.
 2. O11H and O22S that meet the specification $\pm 1.0E-8/24H$ and day drift $\pm 1.0E-9$ at stable temperature.

Sync with you!

O23B (Meet the holdover demand of $\pm 1.5\mu\text{S}/24\text{H}@ \pm 10^\circ\text{C}$)

- Operating Voltage: 3.3V/5.0V
- Power Consumption: Warm up 4.0W, Stable 1.5W
- PKG: DIP 36X27X12.7mm
- ✓ Temperature Stability: $-40^\circ\text{C} \sim +95^\circ\text{C}$, $\pm 0.02\text{ppb}$ / $\pm 0.05\text{ppb}$ / $\pm 0.1\text{ppb}$
- ✓ Day-Aging: $\pm 0.1\text{ppb}$, Year-Aging: $\pm 10\text{ppb}$
- Phase Noise: @10MHz

-125dBc/Hz	10Hz
-145dBc/Hz	100Hz
-150dBc/Hz	1KHz
-155dBc/Hz	10KHz
-155dBc/Hz	100KHz
-155dBc/Hz	1MHz



**Wide Temperature
Range Stratum 2A**

- Application: Banking, Power Grid, Base Station, Router, Switch, Instrument

Sync with you!

O22S (Meet the holdover demand of $\pm 1.5\mu\text{s}/8\text{H}@ \pm 10^\circ\text{C}$)

- Operating Voltage: 3.3V/5.0V
- ✓ Power Consumption: Warm Up 2.5W, Stable 0.8W
- ✓ PKG: SMD 25.4X22.4X12mm
- ✓ Temperature Stability: $-40^\circ\text{C} \sim +105^\circ\text{C}$, $\pm 0.05\text{ppb}$ / $\pm 0.1\text{ppb}$ / $\pm 0.5\text{ppb}$
- Day-Aging: $\pm 0.3\text{ppb}$, Year-Aging: $\pm 0.03\text{ppm}$
- Phase Noise: @10MHz

-120dBc/Hz	10Hz
-140dBc/Hz	100Hz
-155dBc/Hz	1KHz
-160dBc/Hz	10KHz
-162dBc/Hz	100KHz
-165dBc/Hz	1MHz



SMD Stratum 2 OCXO

**5G BBU,
Small Cell
Solution**

- Application: Banking, Power Grid, Base Station, Router, Switch, Instrument

Sync with you!

O11E (Fully meet requirement of stratum 3E clock)

- Operating Voltage: 3.3V
- Power Consumption: Warm-up 2.5W, Stable 0.8W
- ✓ Temperature Stability: $-40^{\circ}\text{C} \sim +95^{\circ}\text{C}$ / $-40^{\circ}\text{C} \sim +105^{\circ}\text{C}$, $\pm 0.2\text{ppb}$ / $\pm 0.5\text{ppb}$ / $\pm 1\text{ppb}$
- ✓ Day-Aging: $\pm 0.5\text{ppb}$, Year-Aging: $\pm 0.03\text{ppm}$
- PKG: SMD 20.3X13.0X11.0mm
- Phase Noise: @10MHz

-120dBc/Hz	10Hz
-140dBc/Hz	100Hz
-155dBc/Hz	1KHz
-158dBc/Hz	10KHz
-160dBc/Hz	100KHz
-160dBc/Hz	1MHz



**SMD, SC-cut,
Hermetically
Meet $15^{\circ}\text{C}/\text{min}$ temperature
variation rate**

**5G
BBU,AAU,
Small Cell
Solution**

- Application: Base Station, Broadcasting, Instrument, Micro Wave, Picocell, CPE-PTN, Dispatch System, Cluster Network

Sync with you!

O11H (Fully meet requirement of stratum 3E clock)

- Operating Voltage: 3.3V
- Power Consumption: Warm Up 1.5W, Stable 0.6W
- PKG: SMD 10.0X15.0X9.0mm
- ✓ Temperature Stability: $-40^{\circ}\text{C} \sim +95^{\circ}\text{C}$, $\pm 5\text{ppb}$ / $\pm 10\text{ppb}$
- ✓ Year-Aging: $\pm 0.05\text{ppm}$
- Phase Noise: @10MHz

-120dBc/Hz	10Hz
-140dBc/Hz	100Hz
-150dBc/Hz	1KHz
-155dBc/Hz	10KHz
-155dBc/Hz	100KHz
-160dBc/Hz	1MHz



**SMD, Small size Hermetically
Meet $15^{\circ}\text{C}/\text{min}$ temperature
variation rate**

- Application: Base Station, Broadcasting, Instrument, Micro Wave, Picocell, CPE-PTN, Dispatch System, Cluster Network

Sync with you!

O11F (Overall drift is better than $\pm 1E-8/24H@-40\sim 105^{\circ}C$)

- Operating Voltage: 3.3V
- Power Consumption: Warm Up 1.5W, Stable 0.6W
- ✓ PKG: SMD 9.0X14.0X6.5mm
- ✓ Temperature Stability: $-40^{\circ}C \sim +105^{\circ}C$, $\pm 10ppb$ / $\pm 25ppb$ / $\pm 50ppb$
- Day-Aging: $\pm 3ppb$, Year-Aging: $\pm 0.5ppm$
- ✓ Short-term stability: $5E-11/S$
- Phase Noise: @10MHz

-115dBc/Hz	10Hz
-140dBc/Hz	100Hz
-150dBc/Hz	1KHz
-155dBc/Hz	10KHz
-155dBc/Hz	100KHz
-160dBc/Hz	1MHz



Cost Effective, SMD
Small size, Stratum 3E

**5G AAU,
Small Cell
Solution**

- Application: Base Station, Broadcasting, Instrument, Micro Wave, Picocell, CPE-PTN, Dispatch System, Cluster Network

Sync with you!

O79 (small package and high temperature stability)

- Operating Voltage: 3.3V
- Power Consumption: Warm Up 460mA, Stable 250mA
- ✓ PKG: SMD 9.7*7.5*3.9mm
- ✓ Temperature Stability: $-40^{\circ}\text{C} \sim +95^{\circ}\text{C}$, $\pm 20\text{ppb}$
- Day-Aging: $\pm 3\text{ppb}$, Year-Aging: $\pm 0.5\text{ppm}$
- ✓ Phase Noise: $-160\text{dBc}@1\text{KHz}$

-102dBc/Hz	10Hz
-135dBc/Hz	100Hz
-155dBc/Hz	1KHz
-162dBc/Hz	10KHz
-165dBc/Hz	100KHz
-165dBc/Hz	1MHz



Application: O79 Series OCXO is designed specially for 5G AAU application, also suitable for applications with small package and high temperature stability requirements.

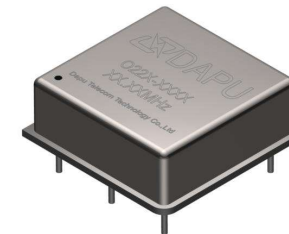
Sync with you!

O22B -100M (Ultra low phase noise: -140dBc/Hz@10Hz)

- Operating Voltage: 3.3V/5.0V/12V
- Power Consumption: Warm Up 4.5W, Stable 2.0W max
- PKG: SMD 25.4X25.4X13.0mm
- Temperature Stability: -40°C~ +85°C, ± 10 ppb/ ± 50 ppb
- Day-Aging: ± 3 ppb, Year-Aging: ± 0.1 ppm
- ✓ Phase Noise: @100MHz

-110dBc/Hz	10Hz
-140dBc/Hz	100Hz
-165dBc/Hz	1KHz
-180dBc/Hz	10KHz
-180dBc/Hz	100KHz
-180dBc/Hz	1MHz

- Application: Base Station, LTE, Instrument, Micro Wave



Ultra low
phase noise

High frequency,
low phase noise

Sync with you!

PART 03

TCXO
VCXO

Sync with you!

Solutions of Stratum 3 clock

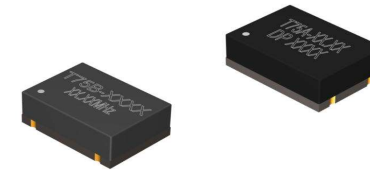
- According to the requirements of stratum 3 clock standards: Frequency drift overall in 10 years should be better than $\pm 4.6\text{ppm}$.
- Dapu promotes T75, T53 and T32 series according to the requirements of stratum 3 clock standards.

Sync with you!

T75 (Normal Stratum 3 TCXO, ultra-wide temperature range)

- Operating Voltage: 3.3V
- Operating Current: 2mA ~8mA
- PKG: SMD 7X5X2.2mm
- ✓ Temperature Stability: $-40^{\circ}\text{C} \sim +105^{\circ}\text{C}$, $\pm 0.05\text{ppm}$ / $\pm 0.1\text{ppm}$ / $\pm 0.28\text{ppm}$ / $\pm 0.5\text{ppm}$
- Year-Aging: $\pm 1\text{ppm}$
- Phase Noise: @10MHz

-95dBc/Hz	10Hz
-120dBc/Hz	100Hz
-138dBc/Hz	1KHz
-148dBc/Hz	10KHz
-150dBc/Hz	100KHz



**High stability under severe environment:
temperature $4^{\circ}\text{C}/\text{min}$ and wind speed
changes from static to $4\text{m}/\text{S}$**

- Application: Small Cell, GPS, SDH, PTN, Nanocell, Femtocell, Picocell, CPE-PTN, WLAN

Sync with you!

T53/T32 (Supper Small Size TCXO, ultra-wide temperature range)

- Operating Voltage: 2.8V/3.0V/3.3V
- Operating Current: 1mA ~3mA
- PKG: SMD 3.2X2.5X1.0mm
- ✓ Temperature Stability: -40°C ~ +105°C, $\pm 0.1\text{ppm}$ / $\pm 0.28\text{ppm}$ / $\pm 0.5\text{ppm}$
- Year-Aging: $\pm 1\text{ppm}$
- Phase Noise: @10MHz

-90dBc/Hz	10Hz
-120dBc/Hz	100Hz
-140dBc/Hz	1KHz
-145dBc/Hz	10KHz
-148dBc/Hz	100KHz



Supper Small TCXO

- Application: Femtocell、Nanocell

Sync with you!

VC936 (High frequency, low phase noise)

- Operating Voltage: 3.3V
- Operating Current: 65mA
- PKG: SMD 14.5*9.6*5.5mm
- Pull rang: 70~130ppm/V
- Phase Noise: @491.52MHz

-55dBc/Hz	10Hz
-85dBc/Hz	100Hz
-110dBc/Hz	1KHz
-130dBc/Hz	10KHz
-142dBc/Hz	100KHz



Low phase noise

- Application: RRU

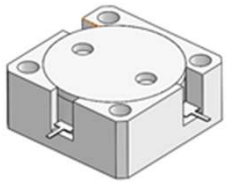
Sync with you!

PART 04

Circulator

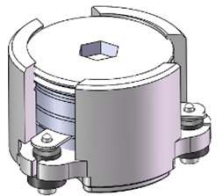
Sync with you!

Circulator



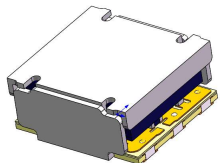
Drop-In Circulator & Isolator

19mm*19mm、 25.4mm*25.4mm、 31.8mm*31.8mm、
31.8mm*38.8mm ...



SMD Circulator & Isolator

Ø7mm、 Ø10mm、 Ø12.5mm、 Ø15mm、 Ø25mm、
9mm*9mm ...



SMD Circulator & Isolator (low power)

5mm*5mm、 7mm*7mm ...

3 Products Series

38 size of package

273 Product PNs

Continue to increase

Sync with you!

Circulator | Product Features



Parameter	Features Description
Frequency	200MHz ~ 9000MHz
Isolation	32dB with single junction
Insertion Loss	0.15dB Min. with single junction
IMD	Up to -80 dBc
Peak Power	Up to 2500W
Reflected Power	Up to 200W

There are 25 core members of the R&D team, with an average of more than 10 years' experience in the development of circulators. Now the whole product range covers sub 6GHz and part of microwave frequency up to 9GHz.

Product Advantages:

The following indicators are all industry-leading

- Low Loss
- Lower Intermodulation
- High consistent of Impedance Matching

IL<0.2dB (For part of 5G bands)

Yield > 99%

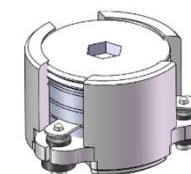
At present, the mainstream application is still SMD especially for mass production. The special buckle cover design patented by DAPU, can avoid the metal chip problem which may be caused by the screw cover design. It will greatly improve the direct pass rate and quality stability of the product.

Sync with you!

Circulator | Ø10mm & 9mm*9mm SMD package

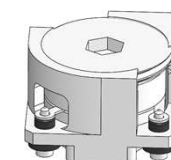


DAPU PN	Frequency (MHz)	Direction	Insertion Loss (dB)	Isolation (dB)	Return Loss (dB)	Power FWD/REV/PEAK (W)
DP0161C	2496-2690	CW	0.25	21	22	50/50/200
DP0162C	2496-2690	CCW	0.25	21	22	50/50/200
DP0159C	3600-3800	CW	0.23	22	22	50/50/200
DP0160C	3600-3800	CCW	0.23	22	22	50/50/200
DP0187C	3400-3600	CW	0.23	21	22	50/50/200
DP0188C	3400-3600	CCW	0.23	21	22	50/50/200
DP0079C	3400-3800	CW	0.3	20	20	50/50/200
DP0080C	3400-3800	CCW	0.3	20	20	50/50/200



Ø10mm

DAPU PN	Frequency (MHz)	Direction	Insertion Loss (dB)	Isolation (dB)	Return Loss (dB)	Power FWD/REV/PEAK (W)
DP1001C	3400-3700	CW	0.33	20	20	50/50/200



9mm * 9mm

Sync with you!

Circulator | Ø7mm SMD package



DAPU PN	Frequency (MHz)	Direction	Insertion Loss (dB)	Isolation (dB)	Return Loss (dB)	Power FWD/REV/PEAK (W)
DP0017C	2515-2685	CW	0.33 Max.	20	20	50/50/200
DP0018C	2515-2685	CCW	0.33 Max.	20	20	50/50/200
DP0019C	3400-3700	CW	0.35 Max.	22	22	50/50/200
DP0020C	3400-3700	CCW	0.35 Max.	22	22	50/50/200
DP0119C	3300-3800	CW	0.5 Max.	16	16	50/50/200
DP0120C	3300-3800	CCW	0.5 Max.	16	16	50/50/200
DP0121C	4400-5000	CW	0.5 Max.	16	16	50/50/200
DP0122C	4400-5000	CCW	0.5 Max.	16	16	50/50/200
DP0201C	3400-3600	CW	0.3 Max.	20	22	50/50/200
DP0202C	3400-3600	CCW	0.3 Max.	20	22	50/50/200
DP0205C	2496-2690	CW	0.4 Max.	20	22	50/50/200
DP0206C	2496-2690	CCW	0.4 Max.	20	22	50/50/200



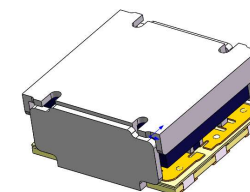
Ø7mm

Sync with you!

Circulator | 5mm*5mm SMD package

Frequency (MHz)	Direction	Insertion Loss (dB)	Isolation (dB)	VSWR	Power FWD/REV (W)
758-803	CW	1.3	10	1.8	10/2
758-803	CCW	1.3	10	1.8	10/2
925-960	CW	0.8	10	1.6	10/2
925-960	CCW	0.8	10	1.6	10/2
1805-1880	CW	0.8	13	1.6	10/2
1805-1880	CCW	0.8	13	1.6	10/2
2110-2170	CW	0.8	13	1.6	10/2
2110-2170	CCW	0.8	13	1.6	10/2

NEW



- The target is to improve insertion loss to **0.7dB Max.** in the whole temperature in 2021.

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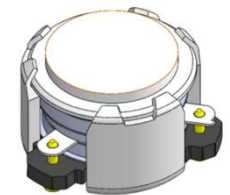
Circulator | Spec. Comparison

Main parameters	Customer required spec.	DP (Ø10mm)	DP (Ø7mm)
Frequency (MHz)	2496 ~ 2690	2496 ~ 2690	2496 ~ 2690
Isolation (dB)	20	21	20
Return Loss (dB)	22	22	22
Insertion Loss (dB)	0.25 (10mm), 0.35 (7mm)	0.25	0.35
Impedance (Ω)	50	50	50
3 rd IMD (Max.) (dBc)	-60 (2 x 5W)	-65 (2 x 5W)	-60 (2 x 5W)
Power FWD/REV/PEAK (W)	30/30/150	50/50/200	50/50/200
Operating Temp. (°C)	-40 to +110	-40 to +110	-40 to +110



Ø7mm

Main parameters	Customer required spec.	DP (Ø10mm)	DP (Ø7mm)
Frequency (MHz)	3400 ~ 3600	3400 ~ 3600	3400 ~ 3600
Isolation (dB)	20	22	20
Return Loss (dB)	22	22	22
Insertion Loss (dB)	0.25 (10mm), 0.3 (7mm)	0.23	0.3
Impedance (Ω)	50	50	50
3 rd IMD (Max.) (dBc)	-60 (2 x 5W)	-66 (2 x 5W)	-60 (2 x 5W)
Power FWD/REV/PEAK (W)	30/30/150	50/50/200	50/50/200
Operating Temp. (°C)	-40 to +110	-40 to +110	-40 to +110



Ø10mm

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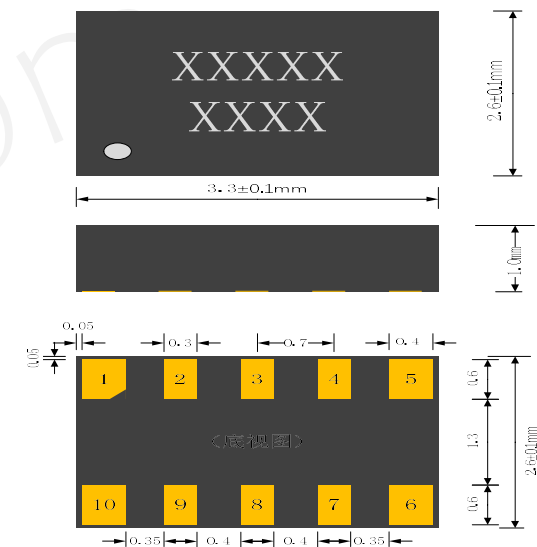
PART 05

Clock IC

Sync with you!

Real Time Clock IC _INS9502

- Built-in: 32.768 kHz TCXO
- High Stability:
 - INS5902A < $\pm 2\text{ppm}$ @ $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
 - INS5902B < $\pm 5\text{ppm}$ @ $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
 - INS5902C < $\pm 10\text{ppm}$ @ $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
- Ultra-low current consumption: 0.7uA (Typ.)
- Supports I2C-Bus
- Alarm interrupt and Wakeup timer interruption
- Auto correction of leap years (from 2000 to 2099)
- Wide voltage range: 1.6 V to 5.5 V
- Built-in Backup switchover circuit
- Package: 3.2*2.5*1.0mm @10 pins



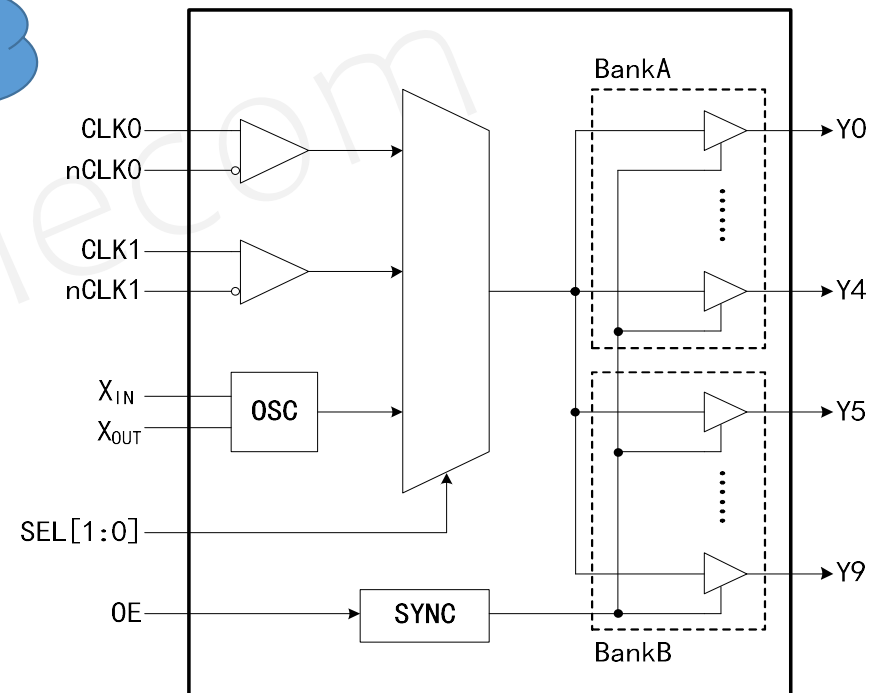
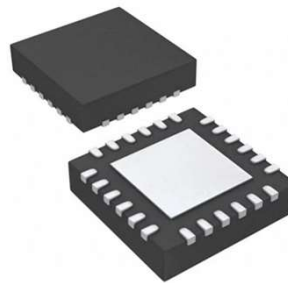
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Clock Fanout Buffer

- Output: 1:5 / 1:10 LVCMOS
- Additive RMS Jitter: **50fs**/Typical
- Level Translator: 3.3/2.5/1.8/1.5V
- Frequency: 0~200MHz
- Package: QFN-24/32

4.0mm X 4.0mm

5.0mm x 5.0mm



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PART 05

1588 Chipsets

Sync with you!

IEEE 1588v2 Chipset - DPSync



One-chip Sync solution

- On chip packet filtering algorithm, BMCA and clock management
- No risk from CPU loading & multi-task
- Seamless integration of all clocks
SETS, PTP, SyncE & hybrid
- Flexible Timestamping options (3 Modes)

Easy for design in

- No CPU load
- Simple interface used only for control and configuration of DPSync
- Free API code provided for easy design
- Zero-effort upgrade: new FW maintains API interface compatibility;
- Support for all system architectures

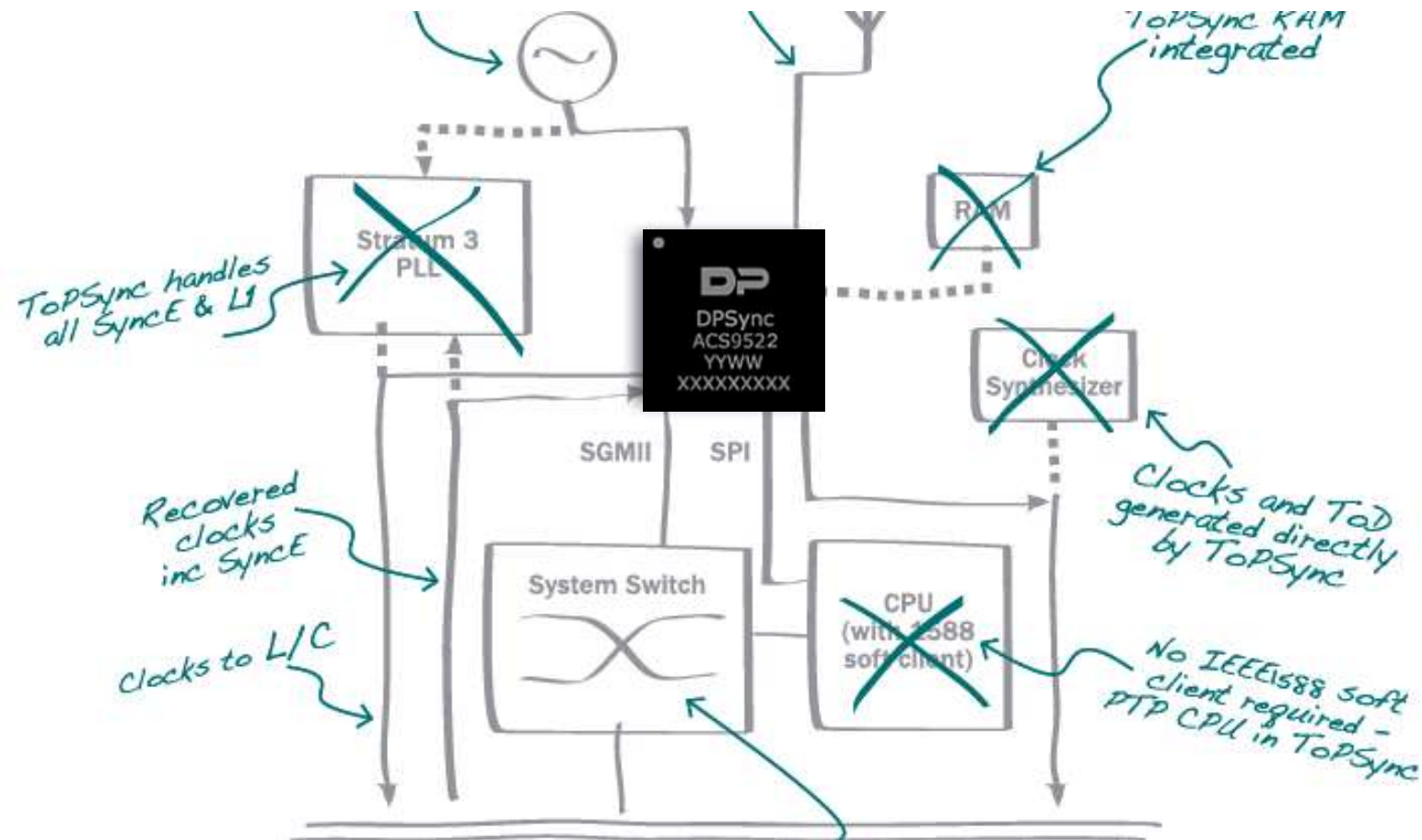
Support Most Profile

- G.8261
- G.8262
- G.8265.1
- G.8275.1
- G.8273.2



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IEEE 1588v2 Chipset - DPSync



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IEEE 1588v2 Chipset - DPSync



Available NOW				
Picture	PN	Package	Key Features	Typical Target Market
	ACS9520	BGA 256 14x14(mm)	Multiple simultaneous masters and hybrid slaves.	PTN, I.P. Backhaul, Aggregation, Routers, Switches, NodeB, uWave
	ACS9522	BGA 324 19x19(mm)	As ACS9520 with internal RAM	
	ACS9521	BGA 324 19x19(mm)	As ACS9522 without internal SETS module	
	ACS9528	BGA 324 19x19(mm)	As ACS9521 without PTP slave function	

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Thank You !

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