

DAPU



Sync with you!

Technology
Partner



**Richardson
Electronics**
POWER & MICROWAVE
TECHNOLOGIES



800.348.5580
630.208.2200



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CONTENTS

01

Company Profile

02

Product Line & Market

03

Product Introduction

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Part 1

Company Profile



Overview



- Founded in **2005**, DAPU TELECOM, with its headquarter in SSL hi-tech industrial park **Dongguan China**.
- Dapu provides **Frequency, Clock, Timing and RF products** for global customers.
- **Focus on telecom industry**, started in 3G, growing in 4G and **leading in 5G**. DAPU has become a strategic partner with the world's **Tier 1 customers**.
- Provides high-quality products and excellent services to **1700+ customers in 20+ countries** around the world.
- **Customized solution and cutting edge technology**, create technical innovation and cost effective value for customers .



500+ staff



>15%
R&D Investment



>25%
R&D staff



6
Subsidiaries

Mission, Vision & Value

Mission

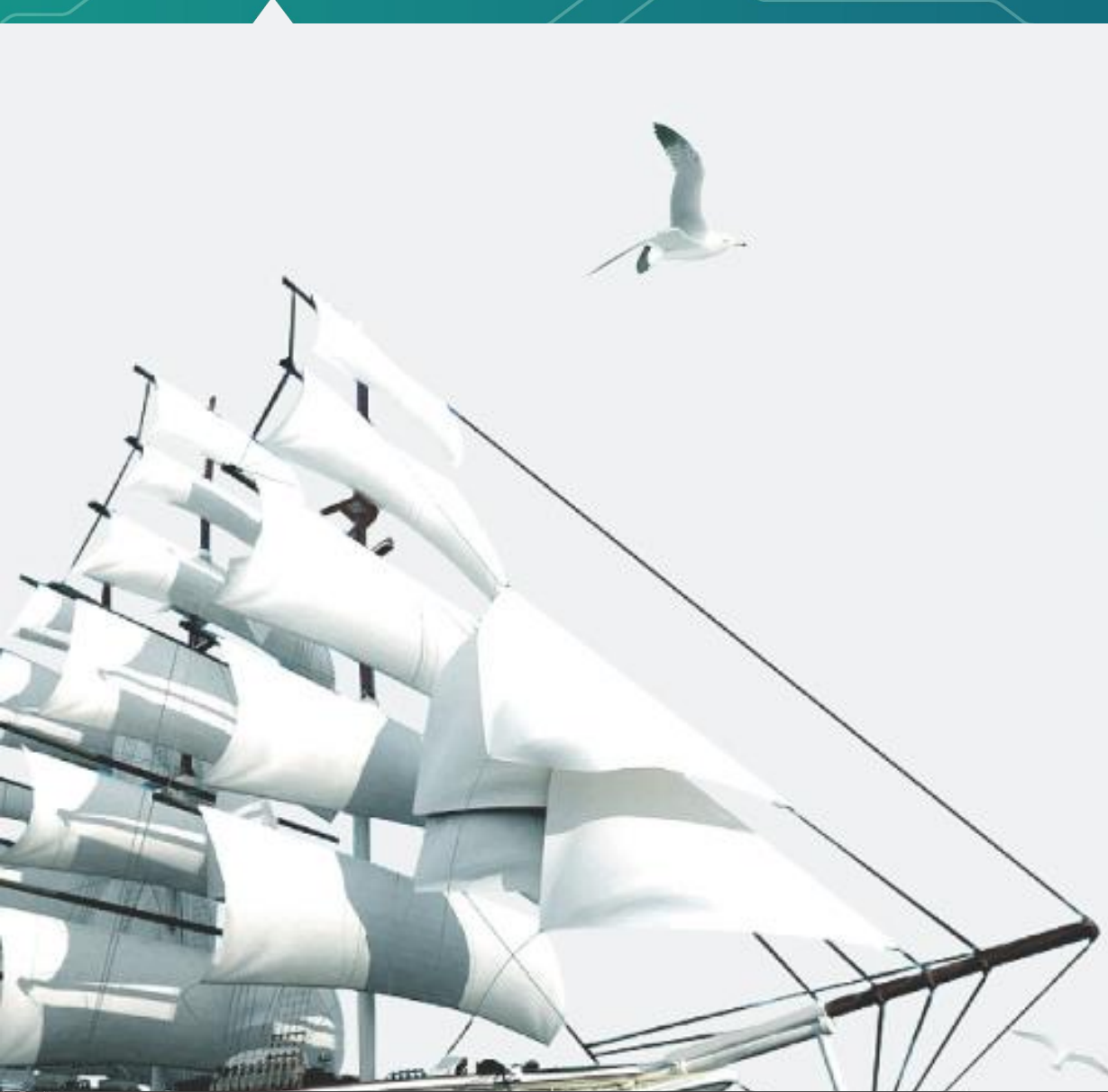
Focus on providing core products and solutions for the ICT & AIoT field, creating value for customers

Vision

Become a global technology leader in the field of clocks and RF, and explore the future together with strategic partners

Value

Integrity, Quality, Learning and Creation



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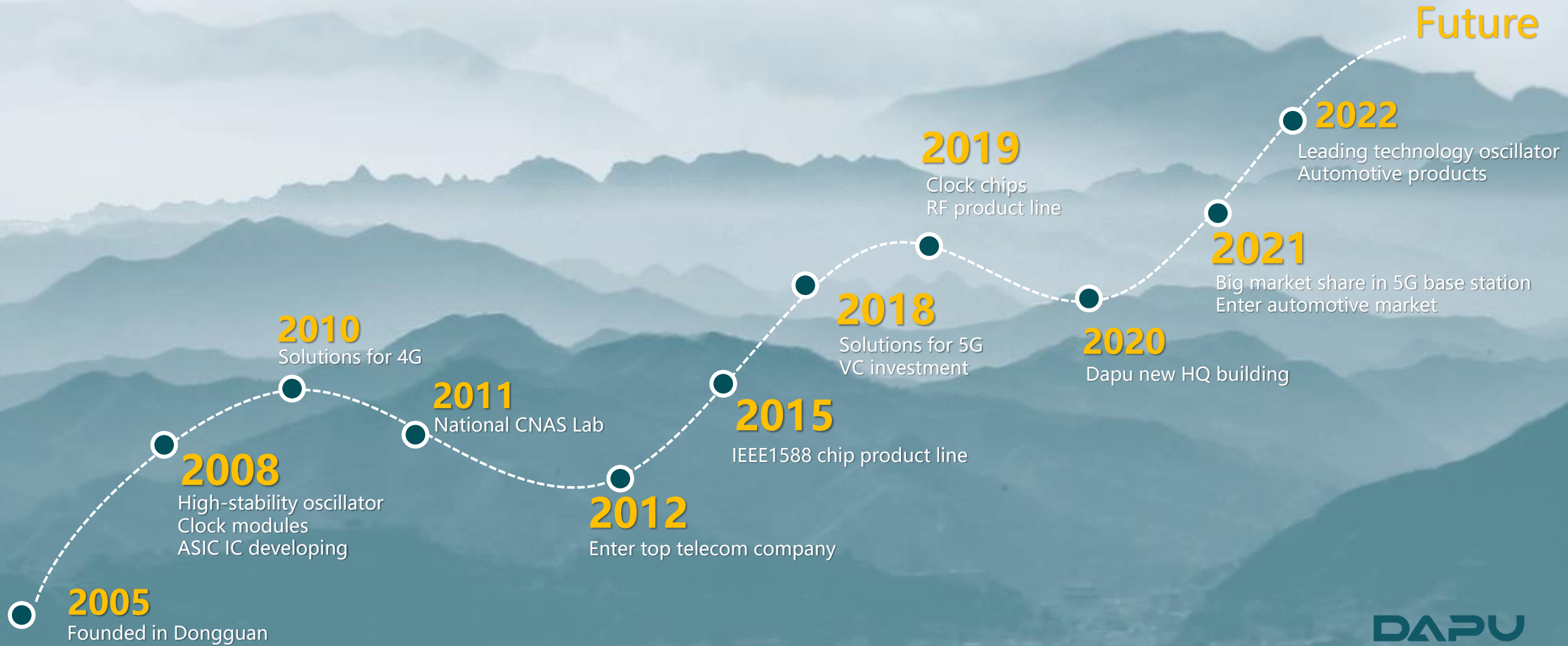


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Milestone



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DAPU

Branches



Head Quarter



3 Manufacturing center



Chip factory

- Fab : TSMC/UMC/SMIC
- A/T: ASE / HT-tech/Leadyo



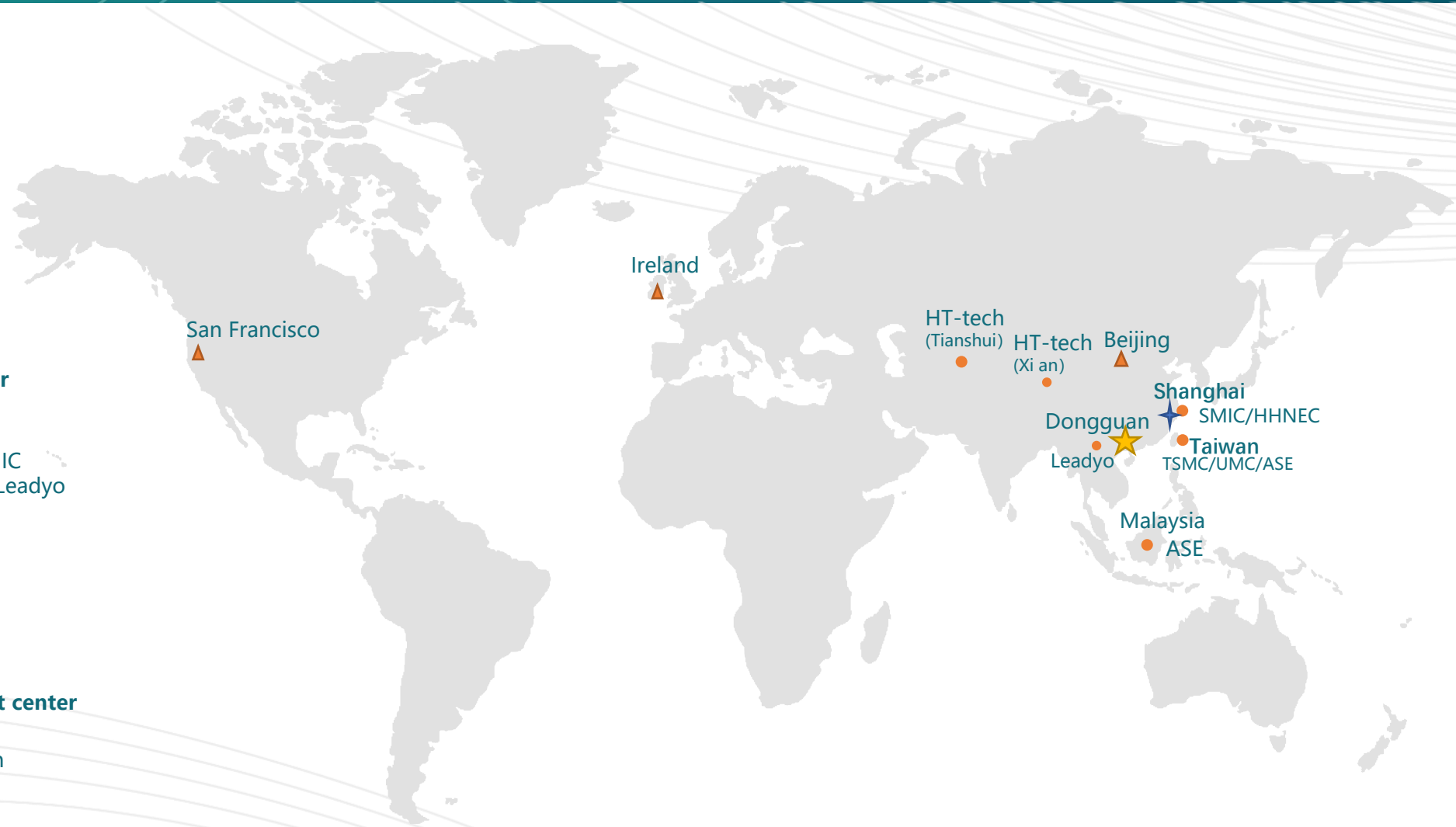
4 R&D Center

- Shanghai (IC)
- Shenzhen(IC)
- Suzhou (Ferrite)
- Dongguan (Clock module/Circulator)



8 Sales & tech. support center

- Ireland Beijing
- Shanghai Shenzhen
- Hangzhou Wuhan
- Dongguan Suzhou



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Company Structure

DAPU TELECOM TECHNOLOGY Co.,LTD

HongKong DAPU

- Sourcing
- Logistics

InterSemi (SZ)

- Timing Chip
- IEEE1588 Developing
- IC R&D Center

FYT (Dongguan)

- RF R&D
- Circulator/Isolator
- Production

Kaymax (Suzhou)

- RF production
- Ferrite Material

Huibiwei(shanghai)

- PLL chip developing
- IC Design

HEFEI DAPU

- SPXO Production
- TCXO Production

- Crystal Oscillator/Clock Module/RTC testing Produced in HQ Guangdong Dapu Telecom.

Innovation & Patents



- 82 Invention patents
- 4 American invention patents
- 84 Utility model patents
- 14 Software copyright
- Others ...



Crystal Oscillator Laboratory



Joint Laboratory of
Microwave with CAS



Joint Laboratory of new generation
communication technology with
Tsinghua University



Joint Laboratory of Ferrite
Material with USTC

CNAS Laboratory



- Includes mechanical lab, environmental lab, physical and chemical lab and electrical property lab
- More than 30 experiment abilities on crystal oscillator, clock module, etc.
- ✓ CNAS was officially approved in Dec. 2011
- ✓ Rated as the key lab of Dongguan in 2013
- Preparing for China National lab accreditation



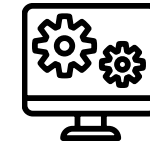
Company Strategy



Market, Branding globalization
Guarantee continuous performance growth
Connect with the world and gain insight into industry dynamics and development



Key Customers
Resource concentration
Deeply penetrated in the main fields and cooperation with strategic customer



Develop strong related technologies and products
High comprehensive cost performance
Provide one-stop service
Maximize synergies



DAPU

Market Strategy



Clock, Timing and RF, provide full solution to all market application



High Stability Clocks



Full Chain Clock Chips



RF components

Part 2

Product Line & Market

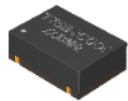


Product Line

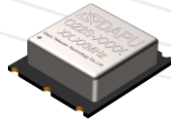
Clock Module



Crystal



SPXO/TCXO



OCXO



Clock Module



Clock Board



Timing Device

Clock Chip



TC-IC



OC-IC



RTC



Silicon XO



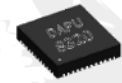
1588 clock chip



Clock Buffer

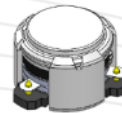


PHY

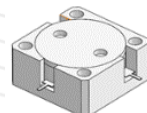


PLL(ongoing)

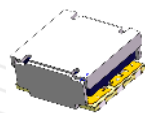
RF Component



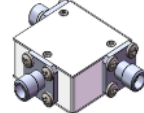
Circulator



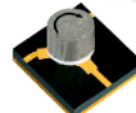
Isolator



Low Power Isolator



Coaxial



Microstrip



Wave Guide



Ferrite

Application Scenarios

Telecom



Automotive



5G Network



Consumers



Power Grid



Transit



Instruments



Appliances



Energy



Cloud Data



Healthcare



Surveillance



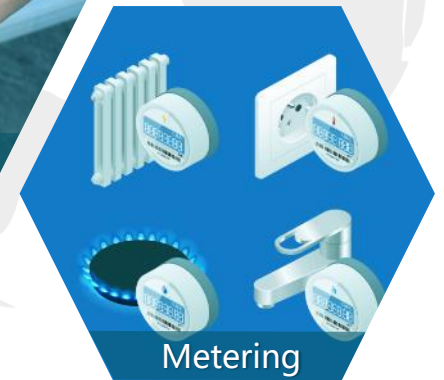
Wearable



Industrial



AR/VR



Metering

Technology Partner



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Technical Advantage – Full Clock Series

Clock Level Standard
GR-1244-CORE

Level 1
Stability: 1E-11

Level 2
Stability: 1.6E-8

Level 3/3E
Stability: 4.6ppm

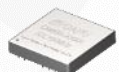
Level 4/4E
Stability: 32ppm

Timing
Server



DP3/5/6 Series
Freq. accuracy: 1E-12/24H
Timing accuracy: 1.0µs/24H

Clock
Module



CM65/55
Acc.: 30ns, 1E-11
Hold: 1.0µs/24H

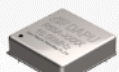


CM35P
Acc.: 50ns, 1E-10
Hold: 1.5µs/24H



CM22
Acc.: 50ns, 1E-10
Hold: 1.5µs/24H

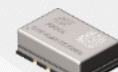
OCXO
(DP IC)



O55
1E-11



O22S
2E-10



O11F
5E-10



O79A
3E-9



O75A
1E-8

TCXO
(DP IC)



T75/T53
0.05ppm



T32
0.28ppm



T21
0.5ppm

OSC (DP IC)
CRYSTAL



SPXO
20ppm



Crystal
20ppm

All-Silicon
OSC



DSO3001
50/30ppm,
Single-end/Diff



DSO311
50/30ppm,
Single-end

Full series of products, self-developed ASIC, wide temperature and high precision, ultra-miniaturization, ultra-low power consumption, high reliability

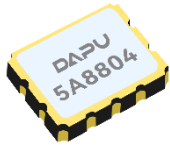
Technical Advantage – RTC

Wide temperature high accuracy



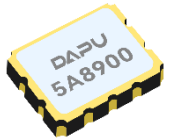
INS5902L/P

Acc.: $\pm 2\text{ppm}$ @ $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
Ext.: $-50^{\circ}\text{C} \sim +85^{\circ}\text{C}$
Power consumption: $1.5\mu\text{A}$
Package: $3.2 \times 2.5 \times 1.0\text{mm}$



INS5A8804(Auto grade)

Acc.: $\pm 3.4\text{ppm}$ @ $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
 $\pm 5.0\text{ppm}$ @ $+80^{\circ}\text{C} \sim +105^{\circ}\text{C}$
Power consumption: $1.2\mu\text{A}$
Package: $3.2 \times 2.5 \times 1.0\text{mm}$



INS5A8900(Auto grade)

Acc.: $\pm 3.4\text{ppm}$ @ $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
 $\pm 5.0\text{ppm}$ @ $+80^{\circ}\text{C} \sim +105^{\circ}\text{C}$
Power consumption: $1.2\mu\text{A}$
Package: $3.2 \times 2.5 \times 1.0\text{mm}$

Ultra-high Accuracy



INS5699C

Acc.: $\pm 3.4\text{ppm}$ @ $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
Power consumption: $1.0\mu\text{A}$
Package: $3.2 \times 2.5 \times 1.0\text{mm}$



INS5699S

Acc.: $\pm 5\text{ppm}$ @ $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
Power consumption: $1.0\mu\text{A}$
Package: $3.2 \times 2.5 \times 1.0\text{mm}$



INS5T8025

Acc.: $\pm 3.4\text{ppm}$ @ $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
Power consumption: $1.2\mu\text{A}$
Package: SOP14

High accuracy



INS5710B

Acc.: $\pm 5\text{ppm}$ (25°C)
Temp.: $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
Power consumption: $0.5\mu\text{A}$
Package: SOP8



INS5710C

Acc.: $\pm 20\text{ppm}$ @ $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
Power consumption: $1.2\mu\text{A}$
Package: SOP8



INS5830X

Acc.: $\pm 5\text{ppm}$ (25°C)
Temp.: $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
Power consumption: $0.5\mu\text{A}$
Package: $3.2 \times 2.5 \times 1.0$

No built-in 32k



INS5101A

Acc.: $\pm 20\text{ppm}$ (25°C)
Temp.: $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
Power consumption: $1.0\mu\text{A}$
Package: SOP8



INS58563

Acc.: $\pm 20\text{ppm}$ (25°C)
Temp.: $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
Power consumption: $1.0\mu\text{A}$
Package: SOP8

Quick start Anti-Vibration



INS5S8563

Acc.: $\pm 200\text{ppm}$ @ $-55^{\circ}\text{C} \sim +125^{\circ}\text{C}$
Power consumption: $1.0\mu\text{A}$
Advant.: impact resistance, fast start



Acc: 100ppm
Size: 1mm^2

Product Advantage – Chips

Clock Sync (IEEE1588)



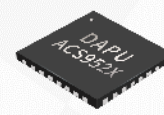
ACS9522
Dual master,
Dual slave
RAM, SETS



ACS9521
Dual master,
Dual slave
RAM



ACS9528
Dual master
RAM



ACS953X
Developing

Clock BUFFER



INS6110
Type: Single-end
Out put: 10



INS6310
Type: Diff.
Out put: 10



INS6104
Type: Single-end
Out put: 4

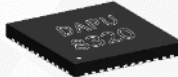


INS65xx
Developing



INS63xx
Developing

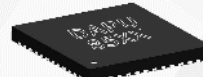
Phase Locked Loop(PLL)



INS8320
Phase noise:100fs RMS
2 PLL



INS86xx
Developing

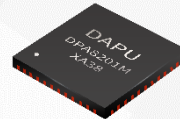


INS85xx
Developing

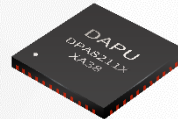
Ethernet(PHY)



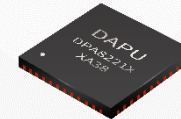
DAP8211R
MAC I/F:RGMII



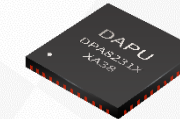
DAP8201M
Developing
RGMII/SGMII



DAP8211S
Developing
2.5G



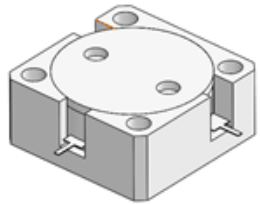
DAP8221x
Developing
5G



DAP8231x
Developing
10G

Focus on the clock chip chain, Continuous technology iteration and products derivation
From Pin-to-Pin replacement to customized solutions

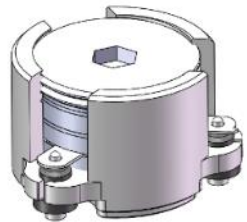
Product Advantage – Circulator/Isolator



Drop In (high power) Circulator & Isolator

12.7mm*12.7, 19mm*19mm, 25.4mm*25.4mm,
31.8mm*31.8mm, 31.8mm*38.8mm, 82mm*82mm etc.

3 Product Series

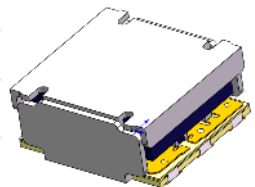


SMD (high power) Circulator & Isolator

3.8mm*3.8mm, Ø5mm, Ø7mm, Ø10mm, Ø12.5mm,
Ø15mm, Ø25mm, 9mm*9mm etc.

45 Package Size

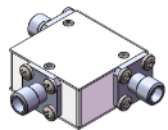
2000+ PNs
(Increasing)



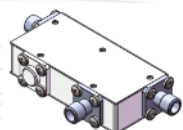
SMD (low power) Circulator & Isolator

5mm*5mm

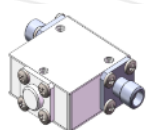
Double-junction, coaxial, broadband, waveguide,
microstrip, millimeter wave circulators & isolators
can be customized by requirements.



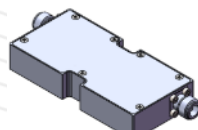
Coaxial Circulator



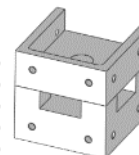
Coaxial Circulator



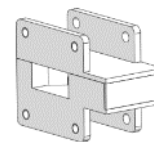
Coaxial Isolator



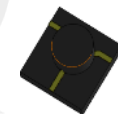
Coaxial Isolator



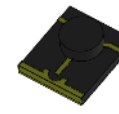
Waveguide Circulator



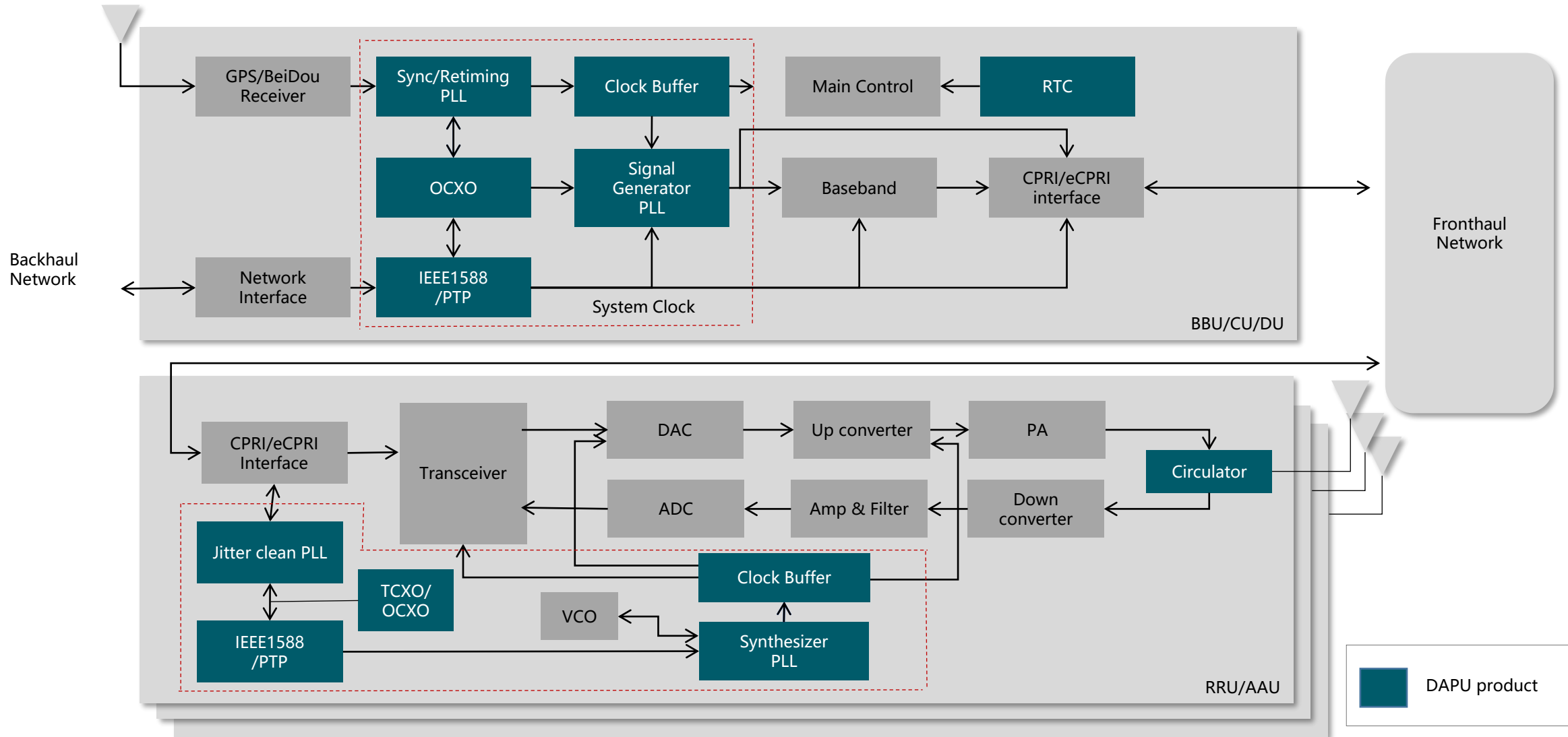
Waveguide Isolator



Microstrip Circulator & Isolator

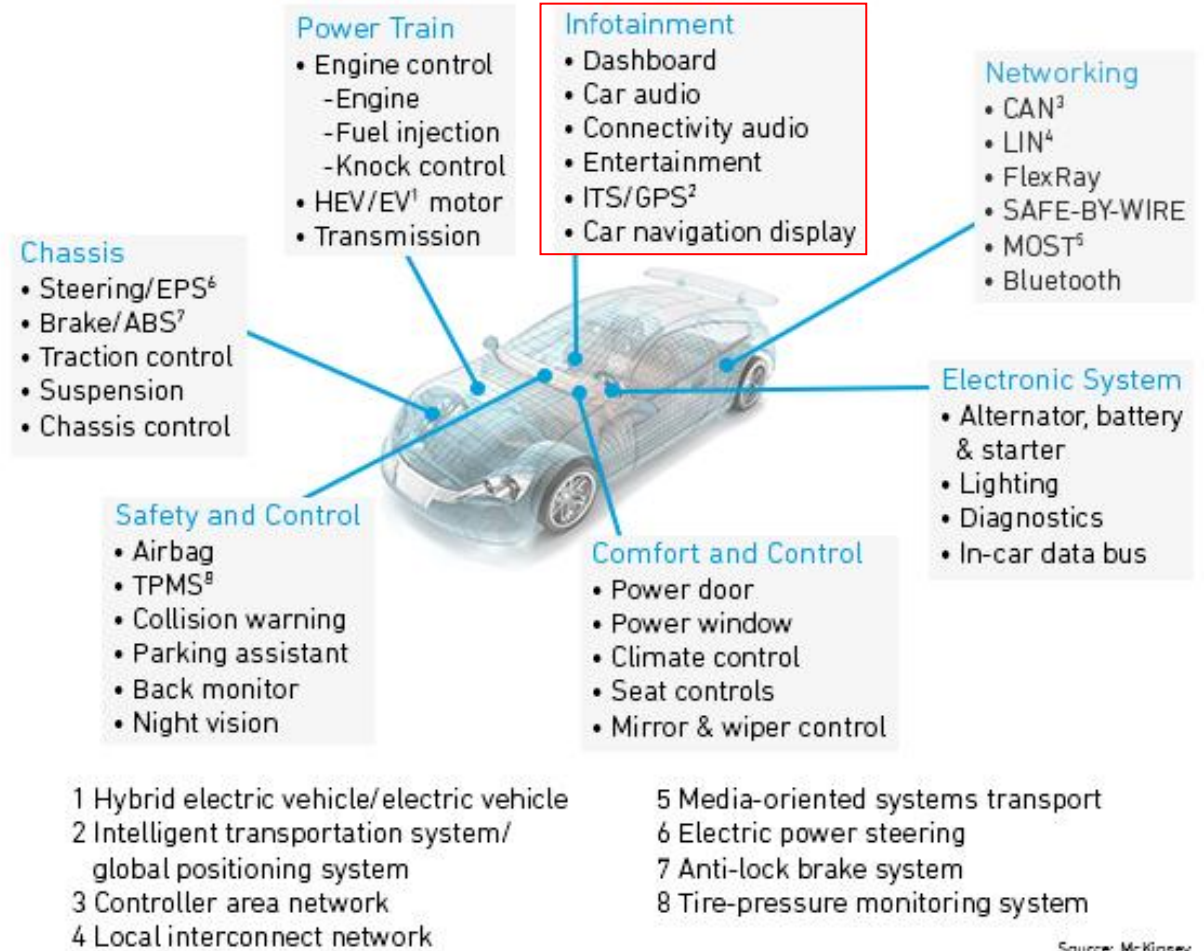


DAPU Product In The Base Station



DAPU Products in Auto

Semiconductors Power Today's Automobiles



**DAPU Auto Grade
 Crystal/SPXO/TCXO
 RTC/Buffer**

Application

**BMS
 T-BOX
 TCU
 EDR
 VDC
 ADAS
 Dashboard
 Audio/Video
 Camera**

Part 3

Product Introduction

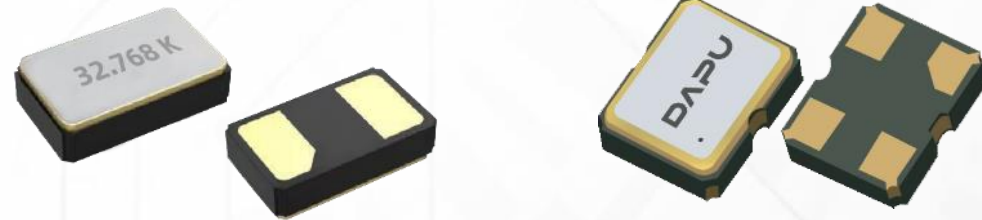
Clock Timing Series

Application

- Automotive electronics
- Smart Terminal
- Smart Appliances
- Industrial Special Equipment
- Communication Equipment
- Wearable Device
- Computing Platform
- Consumer Electronics

Key Features

- Ultra-wide operating temperature range: $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$
- High precision: $\pm 10\text{ppm}$
- Low phase jitter: $42\text{fs} @ 156.25\text{MHz}$
- Output: single-ended, differential
- Ultra-small and ultra-thin



Crystal & SPXO

◆ Crystals | KHz Frequency Range

Product Series	Dimension (mm)	Frequency Range (KHz)	Frequency Tolerance @25°C (ppm)	Operating Temperature (°C)	Load Capacitance (pF)
Crystals (KHz)	1.60*1.00*0.45	32.768KHz	±20	-40 ~ 85	6.0/7.0/9.0/12.5
	2.00*1.20*0.55	32.768KHz	±20	-40 ~ 85 -40 ~ 125	6.0/9.0/12.5
	3.20*1.50*0.80	32.768KHz	±20	-40 ~ 85 -40 ~ 125	6.0/9.0/12.5

◆ Crystals | MHz Frequency Range

Product Series	Size (mm)	Frequency Range (MHz)	Frequency tolerance @25°C (ppm)	Operating Temperature (°C)	Load Capacitance (pF)	Recommend Frequency (MHz)
Crystals (MHz)	1.60*1.20*0.35	24~54	±10ppm ±20ppm ±30ppm Or customized	-40 ~ 85 -40 ~ 105 -40 ~ 125	8pF,10pF,or customized	12.00
	2.00*1.60*0.50	16~96				12.288
						16.00
	2.50*2.00*0.55	12~54				19.20
						20.00
3.20*2.50*0.70	8~54	25.00				
5.00*3.20*1.00	8~54	26.00				
		38.40				
		40.00				
		48.00				
		52.00				
		...				

Crystal & SPXO

◆ SPXO | Single ended output

Product Series	Dimension (mm)	Frequency Range (KHz)	Frequency Tolerance @25°C (ppm)	Operating Temperature (°C)	Recommend Frequency (MHz)
SPXO (Single output)	2.0*1.6*0.7	32.768KHz, 1~60	±20 ±25 ±30 ±50 Or customized	-40 ~ 85 -40 ~ 125 -55 ~ 125	32.768KHz
	2.5*2.0*1.0	32.768KHz, 1~125			12.00
	3.2*2.5*1.2	32.768KHz, 1~125			12.288
	5.0*3.2*1.2	32.768KHz, 1~160			16.00
	7.0*5.0*1.2	32.768KHz, 1~160			16.384
					24.00
					25.00
					32.00
					48.00
					50.00
					54.00
					125.00
					...

◆ SPXO | Differential output

Product Series	Size (mm)	Frequency Range (MHz)	Frequency tolerance @25°C (ppm)	Operating Temperature (°C)	Output waveform	Recommend Frequency (MHz)
SPXO (Differential output)	3.2*2.5*0.9	50 ~ 220	±50	-40 ~ 85 -40 ~ 105	LVPECL/LVDS HCSL	100 125 156.25
	5.0*3.2*1.2	100 ~ 170	±25/50/100	-40 ~ 85	LVPECL/LVDS HCSL	
	7.0*5.0*1.7	62.5 ~ 220	±25/50/100	-40 ~ 85 -55 ~ 125	LVPECL/LVDS HCSL	

Application

- Wire communication
- Wireless communication
- Private power network
- Industrial control
- Instruments and Apparatuses
- Radar
- Radio station
- Intelligent terminal, etc

Key features

- High Temp stability : $\pm 0.28/0.14/0.05$ ppm
- Wide operating temperature range : $-40^{\circ}\text{C}\sim+85^{\circ}\text{C}/95^{\circ}\text{C}/105^{\circ}\text{C}$
- Low phase noise : $-145\text{dBc}/\text{Hz}@1\text{KHz}$
- Ultra low power consumption : 3.3mW
- Voltage control optional



◆ Super wide temperature | low phase noise | high stability class 3E clock

Product series	Frequency Range (MHz)	Temperature Stability (ppm)	Aging	Phase Noise (dBc/Hz@1K)	Operating temperature (°C)	Size (mm)	Recommend Frequency (MHz)
T75	9.60 ~ 54.00	±0.05/±0.14/±0.28	±5 ppb/Day ±1 ppm/Year	-145	-40 ~ 105	SMD 7.0*5.0*2.2	10.00 12.80 19.20
T53	9.60 ~ 54.00	±0.05/±0.14/±0.28	±5 ppb/Day ±1 ppm/Year	-145	-40 ~ 105	SMD 5.0*3.2*2.0	20.00 38.88 ...

◆ Ultra small package | ultra low power 3E clock

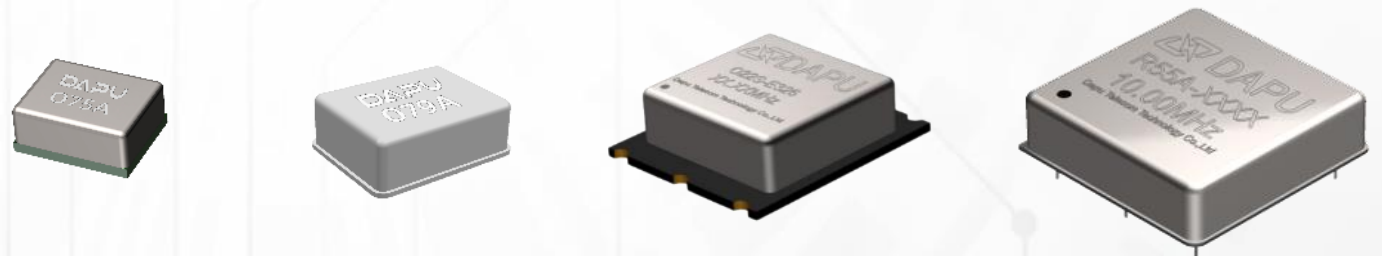
Product series	Frequency Range (MHz)	Temperature Stability (ppm)	Aging	Phase Noise (dBc/Hz@1K)	Operating temperature (°C)	Size (mm)	Recommend Frequency (MHz)
T32	9.60 ~ 54.00	±0.28/±0.5/±1	±20 ppb/Day ±1 ppm/Year	-140	-40 ~ 105	SMD 3.2*2.5*0.9	10.00 19.20
T22	9.60 ~ 52.00	±0.28/±0.5/±1	±20 ppb/Day ±1 ppm/Year	-140	-40 ~ 105	SMD 2.5*2.0*0.8	20.00 25.00 26.00
T21	9.60 ~ 52.00	±0.28 /±0.5/±1	±20 ppb/Day ±1 ppm/Year	-140	-40 ~ 105	SMD 2.0*1.6*0.7	32.00 38.88 ...

Application

- Telecommunications
- Bases station
- Power grid Network
- Optical network
- Instruments

Key features

- High temp stability : $\pm 0.01\text{ppb} \sim \pm 10\text{ppb}$
- Ultra wide operating temperature range : $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}/95^{\circ}\text{C}/105^{\circ}\text{C}$
- Ultra low Phase noise: $-165\text{dBc}/\text{Hz}@1\text{KHz}$
- Ultra low power consumption : 0.8W
- Small size to 7x9, 7x5 and 3225 in future (10mA)



◆ Ultra high stability up to atomic clock level

Product series	Frequency Range (MHz)	Temp Stability (ppb)	Aging	Phase Noise (dBc/Hz@1K)	Operating temp (°C)	Size (mm)	Recommend Freq (MHz)
O55A	5.00/10.00	±0.01	±0.05 ppb/Day ±5 ppb/year	-155	-55 ~ 85	DIP 50.8*50.8*15	5.00 10.00
O23B	5.00/10.00	±0.03	±0.1 ppb/Day ±20 ppb/Year	-155	-55 ~ 85	DIP 36.0*27.0*12.7	...

◆ Ultra high temperature | 2 / 3E clock

Product series	Frequency Range (MHz)	Temp Stability (ppm)	Aging	Phase Noise (dBc/Hz@1K)	Operating temp (°C)	Size (mm)	Recommend Freq (MHz)
O22B	80.00~400.00	±0.1	±0.3 ppb/Day ±30 ppb/Year	-165	-55 ~ 105	DIP 25.0*25.0*12.7	10.00 12.80 100.00
O22S	5.00 ~ 100.00	±0.2	±0.3 ppb/Day ±30 ppb/Year	-155	-55 ~ 105	SMD 25.0*22.0*12.0	...

◆ Small package | wide temperature | high vibration resistance | low power consumption | 3E clock (DAPU ASIC)

Product series	Frequency Range (MHz)	Temp Stability (ppb)	Aging	Phase Noise (dBc/Hz@1K)	G-Sensitivity	Operating temp (°C)	Size (mm)	Recommend Freq(MHz)
O11H	10 ~ 100.00	±0.5/±1/±3/±5/±10	±1 ppb/Day ±0.1ppm/Year	-160	0.5ppb/G	-55 ~ 105	SMD 14.4*9.5*8.0	10.00 12.80
O97	10 ~ 100.00	±0.5/±3/±5/±10/±20	±1 ppb/Day ±0.1ppm/Year	-160	0.2ppb/G	-55 ~ 105	SMD 9.7*7.5*3.9	19.20 20.00 25.00
O75	10 ~ 100.00	±10/±20	±3 ppb/Day ±0.3ppm/Year	-160	0.5ppb/G	-55 ~ 105	SMD 7.5*5.5*3.3	38.88 ...

Ultra Low Phase Noise – OCXO 10M&100M

◆ Ultra low phase noise - 100MHz

Product series	Frequency Range (MHz)	Temp Stability (ppb)	Power supply(V)	Aging	Phase Noise(Typ)	Operating temp (°C)	Size (mm)	G-sensitivity
O22A	100MHz	±10 ±20	3.3 5.0	± 1 ppb/Day ±0.1 ppm/year	-110dBc @10Hz -140dBc@100Hz -165dBc@1KHz -176dBc@10KHz	-40 ~ 85 -55~85	DIP 20*20*10	3ppb/g 0.5ppb/g

◆ Ultra low phase noise - 10MHz

Product series	Frequency Range (MHz)	Temp Stability (ppb)	Power supply(V)	Aging	Phase Noise(max)	Operating temp (°C)	Size (mm)	Short term stability
O23S	10MHz	±1	5.0 12.0	± 0.5 ppb/Day ±30 ppb/year	-120dBc@1Hz -145dBc @10Hz -159dBc@100Hz -165dBc@1KHz -168dBc@10KHz	-20 ~70 -40 ~ 85	SMD 36*27*15	< 3E-13/1s

Ultra Low Power – OCXO

◆ Ultra low power OCXO

Product series	Frequency Range (MHz)	Temp Stability (ppb)	Power supply(V)	Consumption(mA)	Aging	Phase Noise(max) @20M	Operating temp (°C)	Size (mm)	G-sensitivity
O11L O21L	19.2 20.0 25.6 40.0 51.2 128	±10 ±50	3.3 5.0	Warm up – 220 Stable – 70	±0.1 ppm/year	-110dBc @10Hz -140dBc@100Hz -160dBc@1KHz -165dBc@10KHz	-40 ~ 85	DIP 20.4*12.7*10.2 15*15*8.0	0.3ppb/g

Clock Module

Application

- Wire communication
- Wireless communication
- Special power and rail transit network
- Precision instrument
- Base station
- Radio
- etc

Key features

- Synchronization accuracy : $\pm 30\text{ns}$
- Holdover ability : $1.5\mu\text{s}/24\text{ Hours}$ ($\Delta T = \pm 30^\circ\text{C}$)
- Temperature Stability: $\pm 0.01\text{ppb}$ (Rubidium replacement)
- Frequency accuracy : $\pm 1.0\text{E}-12$ (After 1pps24 hours of locking)
- 1S Short stability : $\pm 1.0\text{E}-12$
- Reference input : 1PPS
- Out put: 1PPS + TOD and frequency output



Clock Module

◆ Built in TCXO | ultra wide temperature

Product series	Synchronization accuracy (ns)	Holdover ability	Temp Stability (ppb)	Phase Noise (dBc/Hz@1K)	Operating Temperature (°C)	Size (mm)
CM11T	±50	±5µs/1 H(ΔT=±2°C)	±50	-138	-40 ~ 105	SMD 10.0*10.0*2.2

◆ Built in OCXO | ultra high precision

Product series	Synchronization accuracy (ns)	Holdover ability	Temperature Stability (ppb)	Phase Noise (dBc/Hz@1K)	Operating Temperature (°C)	Size (mm)
CM11H	±50	±12µs/12H(ΔT=±15°C)	±0.5	-160	-40 ~ 85	DIP 14.4*9.5*7.0mm,
CM22	±50	±1.5µs/8H (ΔT=±10°C)	±0.3	-155	-40 ~ 85	DIP 20.2*20.2*9.0
CM55	±30	±1.5µs/24H (ΔT=±15°C)	±0.1	-155	-40 ~ 85	SMD 51.0*51.0*13.0

◆ Built in OCXO + GNSS receiver | ultra wide precision

Product series	Synchronization accuracy (ns)	Holdover ability	Temperature Stability (ppb)	Phase Noise (dBc/Hz@1K)	Operating Temperature (°C)	Size (mm)
CM66	±30	±1.5µs/24H (ΔT=±15°C)	±0.1	-155	-40 ~ 85	DIP 60.0*60.0*13.0

◆ Built in OCXO + 1588/PTP Chip

Product series	Synchronization accuracy (ns)	Holdover ability	Temperature Stability (ppb)	Input/Output	Operating Temperature (°C)	Size (mm)
CM35P	±50	±1.5µs/8H (ΔT=±5°C)	Dual SGMII	1pps/TOD/IPCLK input 1pps/10M/TOD/OPCLK output	-20 ~ 75	SMD 40.0*35.0*13.0

Timing Device

Application

- Wire communication
- Wireless communication
- Special power and rail transit network
- Instruments and meters, etc

Key features

- Support multi-mode
- high-precision timing
- Fast track locking
- Ability to stay ahead of the industry



Timing Device



483 mm(W)x220 mm(D)x 44mm(H)

DP2000

- Support GNSS, GPS/Beidou/GLONASS/Galileo
- Frequency accuracy: $\pm 1.0E-12$
- Phase accuracy : $\pm 50ns$
- Holdover Stability: $\pm 1.5\mu s/24H$ ($\Delta T = \pm 10^{\circ}C$)
- Frequency output: 2 channels of 10MHz, 2 channels of 1PPS, 2 channels of 2.048MHz, 2 channels of arbitrary frequency points (8K ~ 346mhz optional)
- Operating temperature : $-20^{\circ}C \sim +65^{\circ}C$



220 mm(W)x146 mm(D)x44mm(H)

DP3000E

- Support GNSS, GPS/Beidou/GLONASS/Galileo
- Full protocol support IEEE1588V2,
- Support SyncE/NTP
- Meet PRC/PRTC standard
- Frequency accuracy : $\pm 1.0E-12$
- Phase accuracy : $\pm 30ns$
- Hold stability: $\pm 1.5\mu s/24H$ ($\Delta T = \pm 10^{\circ}C$)
- 2 PTP/NTP optical interface, 2 PTP/NTP electrical interface
- 1 channel 1PPS output, 2 *10MHz Frequency Output
- Operating temperature : $-20^{\circ}C \sim +65^{\circ}C$



432mm(W)x230mm(D)x44mm(H)

DP5100

- Support GPS/Beidou/GLONASS/Galileo
- Support IEEE1588V2, 1PPS, Frequency input, TOD
- Full profiles : G.8265.1, G.8275.1, G.8275.2
- Support SyncE/NTP
- Meet PRTC-B standard
- Frequency accuracy : $\pm 1.0E-12$
- Phase accuracy : $\pm 20ns$
- Holdover Stability: $\pm 1.5\mu s/24H$ ($\Delta T = \pm 10^{\circ}C$)
- Up to 24 PTP master optical ports
- Support IEEE1588 switch working mode
- Operating temperature : $-20^{\circ}C \sim +65^{\circ}C$

Clock Chip Series

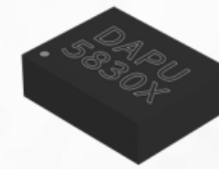
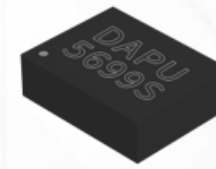
Real Time Clock - RTC

Application

- Communication
- Metering
- Surveillance
- Access
- NVR/DVR
- Automotive TBOX/BMS/CDR

Key features

- Built in temperature compensated crystal oscillator: 32.768KHz
- High precision: $\pm 2\text{ppm}$ @ - 40 °C ~ + 85 °C (deviation: 5S / month)
- Low power consumption: < 1.0uA
- Automatic power switching
- Small size: SMD 3.2 * 2.5 * 1.0mm, SOP 8
- I²C / SPI interface
- **Auto Grade**



Real Time Clock - RTC

◆ Wide Temp & High precision RTC

MPN	Built-in 32K	Accuracy	Port	Consumption	Dimension	Backup Battery Charge
INS5902x	Built-in 32.768K	±2ppm@-40°C ~ +85°C Ext. -55°C ~ +90°C	I2C	1.0uA	3.2*2.5*1.0mm	Yes
INS5A8900 Auto Grade	Built-in 32.768K	±5ppm@-40°C ~ +90°C ±20ppm @ +90°C ~ +105°C	I2C	1.3uA	3.2*2.5*0.9mm	Yes
INS5A8804 Auto Grade	Built-in 32.768K	±5ppm@-40°C ~ +90°C ±20ppm @ +90°C ~ +105°C	I2C	1.5uA	3.2*2.5*0.9mm	No
INS5A4803 Auto Grade	Built-in 32.768K	±5ppm@-40°C ~ +85°C	SPI	1.0uA	SOP14	No
INS5699S-WA	Built-in 32.768K	±5ppm@-40°C ~ +105°C	I2C	1.0uA	3.2*2.5*1.0mm	No

◆ High precision RTC

MPN	Built-in 32K	Accuracy	Port	Consumption	Dimension	Backup Battery Charge
INS5699C	Built-in 32.768K	±3.4ppm@-40°C ~ +85°C	I2C	1.0uA	3.2*2.5*1.0mm	Yes
INS5699S	Built-in 32.768K	±5ppm@-40°C ~ +85°C	I2C	1.0uA	3.2*2.5*1.0mm	Yes
INS5T8025	Built-in 32.768K	±3.4ppm@-40°C ~ +85°C	I2C	1.0uA	SOP14	No

DAPU

Real Time Clock - RTC

◆ Standard RTC

MPN	Built-in 32K	Accuracy	Interface	Consumption	Dimension	Backup Power Supply
INS5710B	Built in 32.768K	5±23ppm (25°C)	I2C	0.8uA	SOP8	No
INS5710C	Built in 32.768K With temp compensation	±20ppm@-20°C ~ +70°C	I2C	1.2uA	SOP8	No
INS5830B	Built in 32.768K	5±23ppm (25°C)	I2C	0.85uA	3.2*2.5*1.0mm	Yes

◆ No Built-in 32.768K RTC

MPN	Built-in 32K	Accuracy	Temp Range	Interface	Consumption	Dimension	Backup Power Supply
INS5101A	No	5±23ppm (25°C)	-40°C ~ +85°C	I2C	1.0uA	SOP8	No
INS58563	No	5±23ppm (25°C)	-40°C ~ +85°C	I2C	0.9uA	SOP8	No

◆ Wide Temp - RTC

MPN	Built-in 32K	Accuracy	Temp Range	Interface	Consumption	Dimension	Backup Power Supply
INS58563	No	±100ppm@-55°C ~ +125°C	-55°C ~ +125°C	I2C	0.8uA	Sop8	No

DAFU

All Silicon Oscillator (SO)

Application

- Telecommunication
- Server, storage
- Switch/router
- PCIe
- Data Center

key features

- No quartz and MEMS parts
- Differential clock: any frequency ranged from 10 kHz ~ 350 MHz, such as LVDS/LVPECL/HCSL, etc.
- Single output clock: any single frequency ranged from 10 kHz ~ 212.5MHz LVCMOS
- Jitter: 350fs (Typ.), compliant with PCIe Gen1/2/3/4/5
- Frequency Stability: +/- 50 ppm
- Support single-frequency/multi-frequency configuration/I2C configuration (optional spread spectrum scheme)
- Built-in LDO with reliable power supply noise rejection
- Standard lead time within 4~6 weeks
- Package: 5 x 3.2 mm, 3.2 x 2.5 mm



All Silicon Oscillator (SO)

◆ Differential/Single output Silicon oscillator | Factory configuration

Product Series	Frequency available range	Overall frequency tolerance (ppm)	Jitter (fs) RMS (12 kHz –20 MHz)	Operating temperature (°C)	Dimension (mm)	Output format
DSO3001 6 Pad	Differential output: 10KHz~350MHz single output: 10KHz~212.5MHz	±25/50	350	-40 ~ 85	SMD 5.0*3.2*0.8 SMD 3.2*2.5*0.8	LVDS, LVPECL, HCSL, CML, LVCMOS or dual LVCMOS
DSO311 4 Pad	Single output: 10KHz~212.5MHz	±50	350	-40 ~ 85	SMD 3.2*2.5*0.8	CMOS

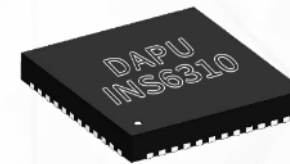
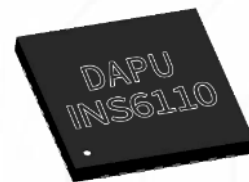
Clock Buffer

Application

- Communication equipment
- Power grid communication
- Private network
- Industrial control
- Instruments
- etc.

Key Features

- Ultra-low additive jitter: <30 fs
- Multiple clock inputs: 3
- Multi-channel clock fanout: 10 channels
- Frequency range: DC ~ 200MHz
- Operating temperature range: -40°C~+85°C
- Supports multiple input clock level signals: LVDS, LVPECL, LVCMOS



Clock Buffer

◆ Single output buffer

Part Number	Output channels	Output level	Output IO voltage (V)	Output frequency (MHz)	additional jitter (fs)	input level	Supply voltage
INS6110	10	LVC MOS	1.5/1.8/2.5/3.3	DC ~ 200	<30	LVDS/LVPECL/LVC MOS/C rystal	2.5/3.3
INS6105	5	LVC MOS	1.5/1.8/2.5/3.3	DC ~ 200	<30		2.5/3.3
INS6104	4	LVC MOS	2.5/3.3	DC ~ 100	<30		

◆ Differential Buffer

Part Number	Output channels	Output level	Output IO voltage (V)	Output frequency (MHz)	additional jitter (fs)	input level	Supply voltage
INS6310	10	LVDS/LVP/ECL/HCSL	2.5/3.3	DC ~ 2500	<80	LVDS/LVPECL/LVC MOS/C rystal	2.5/3.3

◆ Configurable buffer

Part Number	Output channels	Output level	Output IO voltage (V)	Output frequency (MHz)	additional jitter (fs)	input level	Supply voltage
INS6234	4	HCSL/LVC MOS	2.5/3.3	DC ~ 400	<30	LVDS/LVPECL/LVC MOS/C rystal	3.3

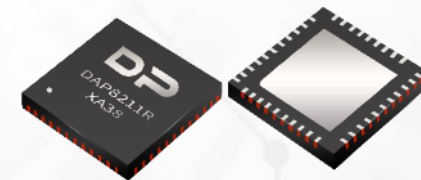
Ethernet Transceiver – PHY chip

Application

- DTV (Digital TV)
- MAU (Media Access Unit)
- Game Console
- Printer and Office Machine
- CNR (Communication and Network Riser)
- LED Display, DVD Player and Recorder
- Ethernet Hub, Ethernet Switch

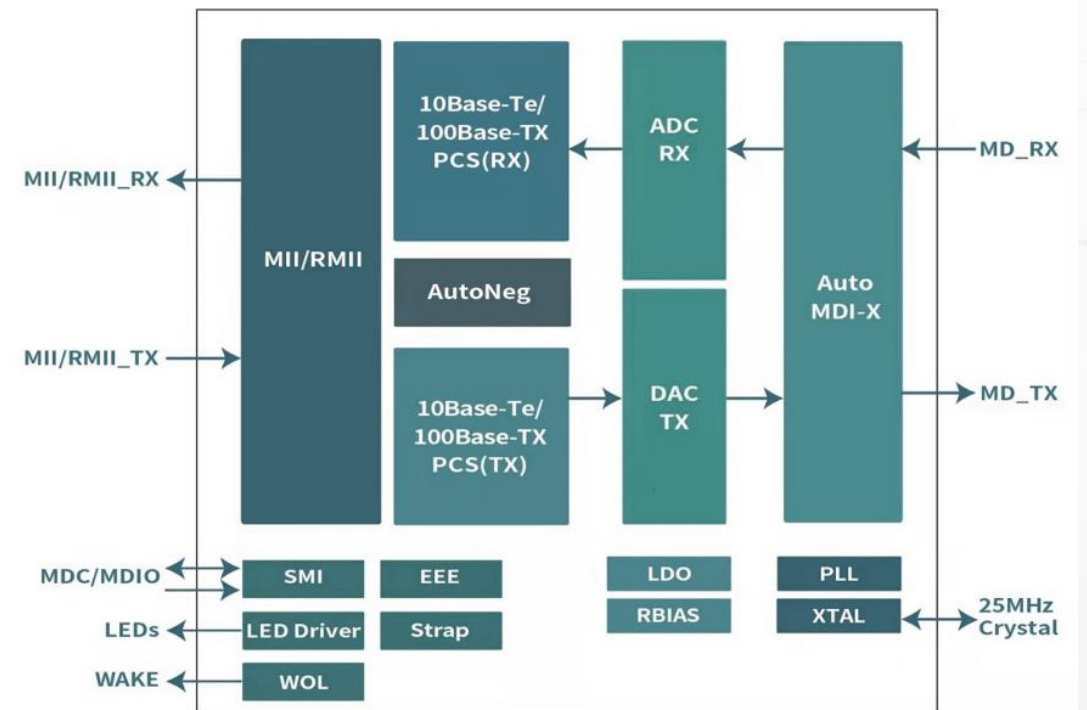
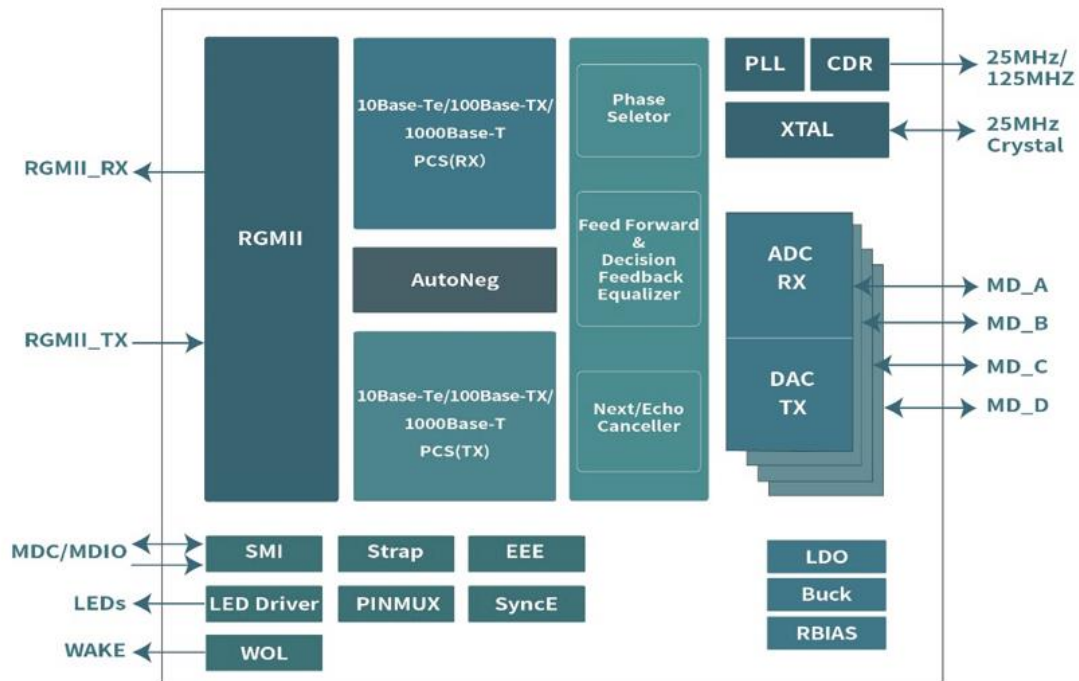
key features

- RGMII MAC interface
- 1000BASE-T IEEE 802.3ab /100BASE-TX IEEE
- 802.3u/10BASE-Te IEEE 802.3 Compliant, EEE(IEEE 802.3az-2010)
- Supports SyncE
- WoL (Wake-on-LAN)
- Sleep Mode
- Crossover Detection & Auto-Correction
- Supports Parallel Detection
- Supports Base Line Wander Correction
- Supports Interrupt function
- Automatic polarity correction
- Integrate Linear/Buck Switching Regulator
- 120 meters at 1000Mbps over CAT.5E cable
- Configurable I/O voltage (3.3 V, 2.5 V, 1.8 V) signaling for RGMII



Ethernet Transceiver – PHY chip

Part Number	MAC interface	physical interface	standard	Operating temperature	package	Remark
DAP8211R(I)	RGMII	Electrical interface	1000BASE-T 100BASE-TX 10BASE-Te	0°C ~ +70°C -40°C ~ +85°C	QFN 40-pin 5mm x 5mm	Support SyncE
DAP8201M(I)	MII/RMII	Electrical interface	100BASE-TX 10BASE-Te	0°C ~ +70°C -40°C ~ +85°C	QFN 32-pin 5mm x 5mm	



IEEE1588/PTP chip

Application

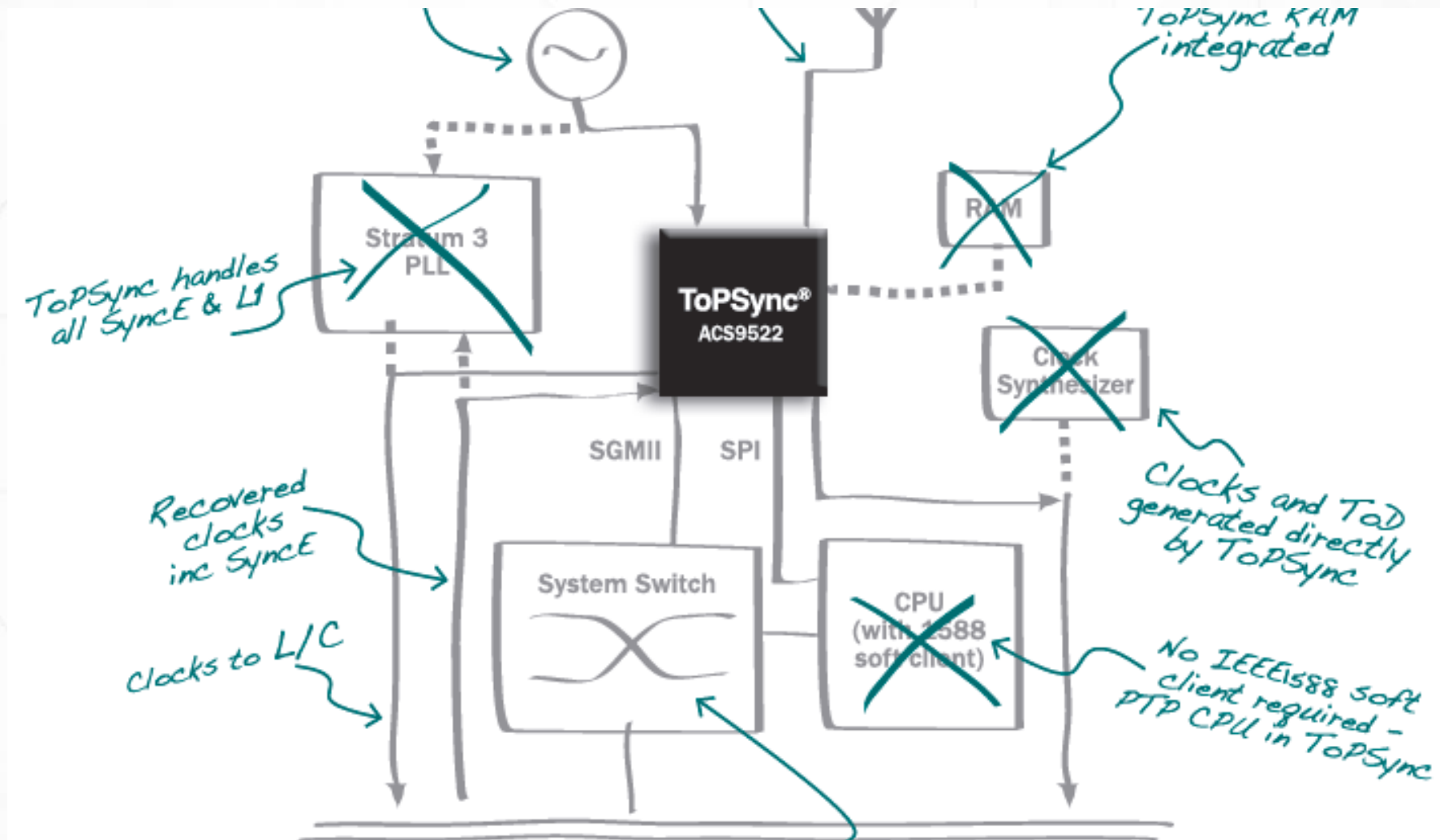
- xPON, GPON/EPON OLT
- PTN
- Network measurement
- Switcher, Router
- Broadcasting device
- Power grid network
- Small Cell
- NodeB

Key features

- Most integrated single chip 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)
- 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 for multiple standards:
 - G.8261/G.8262/G.8265.1/G.8275.1/G.8273.2



IEEE1588/PTP chip



IEEE1588/PTP chip

DPSync ACS952X is a high-performance IEEE1588V2 chip series with full intellectual property. This single chip integrates PLL, MCU, protocol stack IP and independent patented datagram filtering algorithm to realize the timing function of the reference clock through the packet switching network. It is widely used in wireless base stations, transmission networks and computer networks.

Part Number	Package	Characteristics	Operating temperature (°C)
ACS9521	BGA 324 19*19mm	Support dual master and dual slave configuration, built-in RAM	-40 ~ +85
ACS9522	BGA 324 19*19mm	Support dual master and dual slave configuration, built-in RAM, built-in SETs	-40 ~ +85
ACS9528	BGA 324 19*19mm	Support dual master configuration, built-in RAM	-40 ~ +85

RF Components

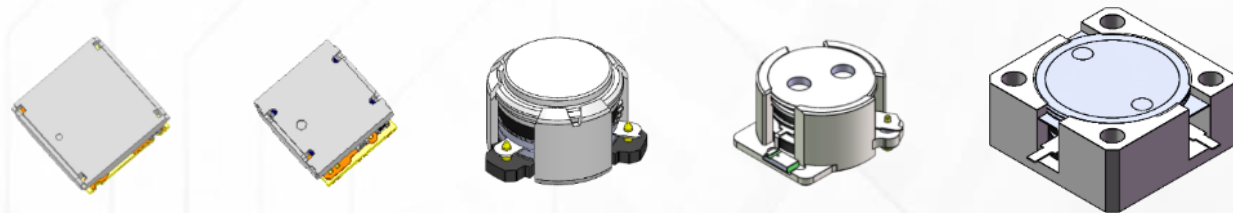
Circulator & Isolator

Application

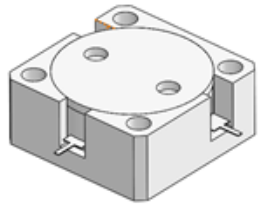
- Base station
- RRH/RRU/AAU
- Small Cell, DAS
- Microwave communication
- Satellite Communication
- Radar
- Broadcasting

Key features

- Frequency: 200MHz ~ 9GHz
- Insertion loss: 0.15dB (minimum) 0.2~0.35dB (typical)
- Input and output return loss: 20dB (minimum) 25~28dB (typical)
- Isolation: 20dB (minimum) 25~30dB (typical)
- Third-order intermodulation IMD: 60dB (minimum) 65~80dB (typical)
- Input and output impedance real part: 50 ± 5 ohm (tolerance can be adjusted according to customer requirements)



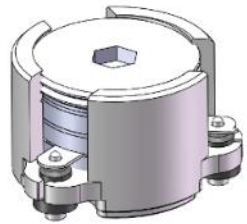
Product Advantage – Circulator/Isolator



Drop In (high power) Circulator & Isolator

12.7mm*12.7, 19mm*19mm, 25.4mm*25.4mm,
31.8mm*31.8mm, 31.8mm*38.8mm, 82mm*82mm etc.

3 Product Series

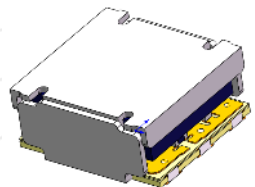


SMD (high power) Circulator & Isolator

3.8mm*3.8mm, Ø5mm, Ø7mm, Ø10mm, Ø12.5mm,
Ø15mm, Ø25mm, 9mm*9mm etc.

45 Package Size

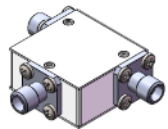
2000+ PNs
(Increasing)



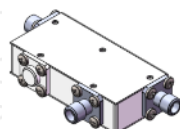
SMD (low power) Circulator & Isolator

5mm*5mm

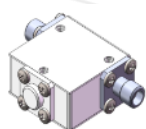
Double-junction, coaxial, broadband, waveguide,
microstrip, millimeter wave circulators & isolators
can be customized by requirements.



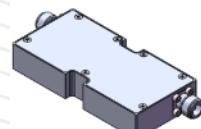
Coaxial Circulator



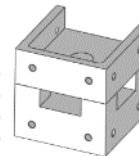
Coaxial Circulator



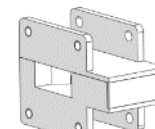
Coaxial Isolator



Coaxial Isolator



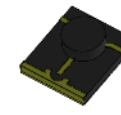
Waveguide Circulator



Waveguide Isolator



Microstrip Circulator & Isolator



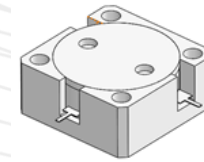
Circulator & Isolator

Circulator/Isolator Frequency Range

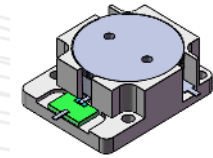
Type	Frequency Band Range (MHz)	Frequency Band (MHz)	Band Width (MHz)	Example
High Power	100-15000	100-700	50MHz Max.	e.g. 300MHz-350MHz it is band width is 50MHz (350-300=50)
		700-1000	10% Max.	e.g. 758MHz-821MHz is 8% band width, $(821-758) / (821 + 758) / 2 = 8\%$
		1000-6000	25% Max.	e.g. 3300MHz-3800MHz is 14% band width $(3800-3300) / (3800 + 3300) / 2 = 14.1\%$
		5000-10000	Full Band	Can support full band, but performance will be deterioration
Low Power	430-5000	430-617	430-617	Can support full band, but performance will be deterioration
		617-960	617-960	
		1805-2690	1805-2690	
		3300-3900	3300-3900	
		4300-5000	4300-5000	

Drop in Series

Size: 12.7mm*12.7mm、20mm*20mm、25.4mm*31.7mm、30mm*30mm、31.8mm*31.8mm、35mm*39mm、38.1mm*38.1mm、38.1mm*45.8mm、42mm*42mm、82mm*82mm etc
Frequency: 100MHz ~15000MHz



Drop In Circulator



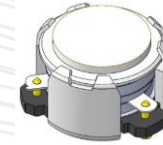
Drop In Isolator

Part Number	Product Type	Frequency (MHz)	Size (mm)	Direction	Insertion Loss (dB)	Isolation (dB)	Return Loss (dB)	Forward Power (W)	Peak Power (W)
DP0453S	Isolator	1610-1675	12.7*12.7	CW	0.45	20	20	50	400
DP0180C	Circulator	930-960	20*20	CCW	0.4	20	19	100	800
DP0173S	Isolator	918-960	25.4*31.7	CW	0.25	23	21	200	1600
DP0166S	Isolator	925-960	25.4*31.7	CCW	0.25	23	21	200	1600
DP0168S	Isolator	1805-1880	25.4*31.7	CCW	0.25	23	21	200	1600
DP0175C	Circulator	390-400	30*30	CW	0.35	20	20	200	1600
DP0177C	Circulator	420-430	30*30	CW	0.35	20	20	200	1600
DP0037S	Isolator	410-470	35*39	CW	0.25	21	21	400	3000
DP1031C	Circulator	700-798	38.1*38.1	CW	0.4	23	21	400	3000
DP1033C	Circulator	960-1224	38.1*38.1	CW	0.4	23	21	400	3000
DP0355C	Circulator	1340-1530	38.1*38.1	CW	0.4	50	21	400	3000
DP0353C	Circulator	1615-1800	38.1*38.1	CW	0.4	50	21	400	3000
DP1023S	Isolator	700-798	38.1*45.8	CW	0.4	23	21	1000	/
DP1025S	Isolator	960-1224	38.1*45.8	CW	0.4	23	21	1000	/
DP0391C	Circulator	320-344	42*42	CW	0.4	20	21	400	3000
DP0392C	Circulator	320-344	42*42	CCW	0.4	20	21	400	3000

SMD (High power) Series

Size: ϕ 10mm

Frequency: 900MHz ~15000MHz



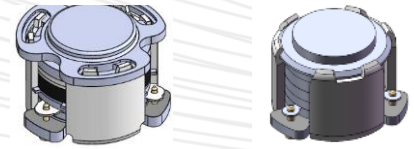
Part Number	Product Type	Frequency Band (MHz)	Size (mm)	Direction	Insertion Loss (dB)	Isolation (dB)	Return Loss (dB)	Forward Power (W)	Peak Power (W)
DP0279C	Circulator	1805-1880	10.2	CW	0.3	21	21	30	240
DP0280C	Circulator	1805-1880	10.2	CCW	0.3	21	21	30	240
DP0325C	Circulator	1930-1995	10.2	CW	0.25	20	20	30	240
DP0311C	Circulator	2110-2170	10.2	CW	0.3	21	21	30	240
DP0312C	Circulator	2110-2170	10.2	CCW	0.3	21	21	30	240
DP0329C	Circulator	2110-2200	10.2	CW	0.25	20	20	30	240
DP0358C	Circulator	2320-2370	10.2	CCW	0.3	21	21	30	240
DP0189C	Circulator	2496-2690	10.2	CW	0.25	21	22	30	240
DP0190C	Circulator	2496-2690	10.2	CCW	0.25	21	22	30	240
DP0031C	Circulator	2515-2685	10.2	CW	0.25	22	22	30	240
DP0032C	Circulator	2515-2685	10.2	CCW	0.25	22	22	30	240
DP0219C	Circulator	3300-3600	10.2	CW	0.3	20	20	30	240
DP0220C	Circulator	3300-3600	10.2	CCW	0.3	20	20	30	240
DP0013C	Circulator	3300-3800	10.2	CW	0.4	20	20	30	240
DP0014C	Circulator	3300-3800	10.2	CCW	0.4	20	20	30	240
DP0187C	Circulator	3400-3600	10.2	CW	0.23	21	22	30	240
DP0188C	Circulator	3400-3600	10.2	CCW	0.23	21	22	30	240
DP0027C	Circulator	3400-3700	10.2	CW	0.23	20	20	30	240
DP0231C	Circulator	3400-3800	10.2	CW	0.3	20	20	30	240
DP0232C	Circulator	3400-3800	10.2	CCW	0.3	20	20	30	240
DP0209C	Circulator	3600-3800	10.2	CW	0.35	20	20	30	240
DP0229C	Circulator	3600-3800	10.2	CW	0.23	21	22	30	240
DP0230C	Circulator	3600-3800	10.2	CCW	0.23	21	22	30	240
DP0333C	Circulator	3700-3980	10.2	CW	0.25	20	20	30	240
DP0297C	Circulator	4800-5000	10.2	CW	0.32	20	20	30	240
DP0298C	Circulator	4800-5000	10.2	CCW	0.32	20	20	30	240
DP0490C	Circulator	4800-5200	10.2	CCW	0.4	17	7	30	240

• ϕ 10mm products could cover the frequency range from 1.4GHz to 8GHz.

SMD (High power) Series

Size: $\phi 7\text{mm}$

Frequency: 1500MHz ~15000MHz



Part Number	Product Type	Frequency Band (MHz)	Size (mm)	Direction	Insertion Loss (dB)	Isolation (dB)	Return Loss (dB)	Forward Power (W)	Peak Power (W)
DP0363C	Circulator	2320-2370	7	CW	0.3	22	22	20	160
DP1021C	Circulator	2320-2370	7	CW	0.55	17	17	20	160
DP0407C	Circulator	2496-2690	7	CW	0.3	20	20	20	160
DP0408C	Circulator	2496-2690	7	CCW	0.3	20	20	20	160
DP0309C	Circulator	2515-2675	7	CW	0.3	20	22	20	160
DP0310C	Circulator	2515-2675	7	CCW	0.3	20	22	20	160
DP0283C	Circulator	3300-3600	7	CW	0.35	19	19	20	160
DP0284C	Circulator	3300-3600	7	CCW	0.35	19	19	20	160
DP0119C	Circulator	3300-3800	7	CW	0.5	16	16	20	160
DP0401C	Circulator	3400-3600	7	CW	0.23	21	22	20	160
DP0402C	Circulator	3400-3600	7	CCW	0.23	21	22	20	160
DP0277C	Circulator	3400-3700	7	CW	0.33	18	18	20	160
DP0417C	Circulator	3400-3800	7	CW	0.3	20	22	20	160
DP0418C	Circulator	3400-3800	7	CCW	0.3	20	22	20	160
DP0289C	Circulator	3420-3800	7	CW	0.35	20	21	20	160
DP1019C	Circulator	3450-3650	7	CW	0.35	20	20	20	160
DP0515C	Circulator	3500-4000	7	CW	0.45	17	17	20	160
DP1027C	Circulator	3520-3560	7	CW	0.35	20	20	20	160
DP1028C	Circulator	3520-3560	7	CCW	0.35	20	20	20	160
DP0281C	Circulator	3550-3700	7	CW	0.3	20	20	20	160
DP0282C	Circulator	3550-3700	7	CCW	0.3	20	20	20	160
DP0405C	Circulator	3600-3800	7	CW	0.25	21	20	20	160
DP0406C	Circulator	3600-3800	7	CCW	0.25	21	20	20	160
DP1029C	Circulator	3700-3800	7	CW	0.35	20	20	20	160
DP1030C	Circulator	3700-3800	7	CCW	0.35	20	20	20	160
DP0121C	Circulator	4400-5000	7	CW	0.5	16	16	20	160

• $\phi 7\text{mm}$ products could cover the frequency range from 1.8GHz to 8GHz.

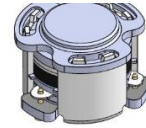
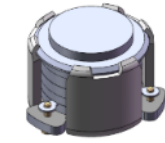
Small Size with Wide Band - $\Phi 7$ & $\Phi 10$

- The PNs which could cover **1805MHz ~ 2700MHz & 3300-4200MHz** are the latest wideband products, especially **$\Phi 10$ mm DP2154C** (1805MHz ~ 2200MHz) and **$\Phi 7$ mm DP2154C** (1805MHz ~ 2170MHz) are in mass production now.

Part Number	Product Type	Frequency Band (MHz)	Size (mm)	Direction	Insertion Loss (dB)	Isolation (dB)	Return Loss (dB)	Forward Power (W)	Peak Power (W)
DP2357C	SMD (Circulator)	1805-2170	$\Phi 7$	CW	0.70/0.80	16/14	16/14	20	150
DP2358C	SMD (Circulator)	1805-2170	$\Phi 7$	CCW	0.70/0.80	16/14	16/14	20	150
DP0571C	SMD (Circulator)	1880-2025	$\Phi 7$	CW	0.6	15	15	20	150
DP0572C	SMD (Circulator)	1880-2025	$\Phi 7$	CCW	0.6	15	15	30	200
DP2059C	SMD (Circulator)	3300-4000	$\Phi 7$	CW	0.6	15	15	20	150
DP2060C	SMD (Circulator)	3300-4000	$\Phi 7$	CCW	0.6	15	15	30	200
DP0573C	SMD (Circulator)	2300-2700	$\Phi 7$	CW	0.35/0.5	20/18	20/18	20	150
DP0574C	SMD (Circulator)	2300-2700	$\Phi 7$	CCW	0.35/0.5	20/18	20/18	30	200

Part Number	Product Type	Frequency Band (MHz)	Size (mm)	Direction	Insertion Loss (dB)	Isolation (dB)	Return Loss (dB)	Forward Power (W)	Peak Power (W)
DP0575C	SMD (Circulator)	1805-2170	$\Phi 10.2$	CW	0.6	15	18	30	200
DP0576C	SMD (Circulator)	1805-2170	$\Phi 10.2$	CCW	0.6	15	18	30	200
DP2153C	SMD (Circulator)	1805-2200	$\Phi 10.2$	CW	0.4/0.45	/	/	30	200
DP2154C	SMD (Circulator)	1805-2200	$\Phi 10.2$	CCW	0.4/0.45	/	/	30	200
DP2001C	SMD (Circulator)	3300-4200	$\Phi 10.2$	CW	0.5	16	16	30	200
DP2002C	SMD (Circulator)	3300-4200	$\Phi 10.2$	CCW	0.5	16	16	30	200
DP2433C	SMD (Circulator)	3300-4000	$\Phi 10.2$	CW	0.55	20	20	30	200
DP2434C	SMD (Circulator)	3300-4000	$\Phi 10.2$	CCW	0.55	20	20	30	200

SMD Φ 7mm (5G band Performance)



DAPU PN	Frequency (MHz)	Direction	Insertion Loss (dB)	Isolation (dB)	Return Loss (dB)	IM3 (dBc)	2 nd Attenuation (dB)	Power FWD/REV/PEAK (W)
DP0243C	2496-2690	CW	0.26 Max.	22	22	-60@2X5W,1MHz Spacing	30	30/30/150
DP0241C	3400-3600	CW	0.23 Max.	22	22	-65@2X5W,1MHz Spacing	25	30/30/150
DP0289C	3420-3800	CW	0.30 Max.	21	21	-60@2X5W,1MHz Spacing	18	30/30/150
DP0277C	3400-3700	CW	0.30 Max.	21	22	-60@2X5W,1MHz Spacing	22	30/30/150

- Φ 7mm products could cover the frequency range from 1.8GHz to 10GHz.

DAPU

Drop in & SMD (high power) wideband & lower IL products

- The PNs which could cover **758MHz ~ 960MHz and 1805MHz ~ 2700MHz** are the latest wideband products, especially for DP2116S (758MHz ~ 960MHz) which is in mass production now.

Part Number	Product Type	Frequency Band (MHz)	Size (mm)	Direction	Insertion Loss (dB)	Isolation (dB)	Return Loss (dB)	Forward Power (W)	Peak Power (W)
DP2122C	SMD (Circulator)	617-768	Φ25.4	CCW	0.35	20	20	300	2400
DP2116S	Drop In (Isolator)	758-960	31.8*31.8	CCW	0.3/0.35	20/18	20/18	300	2400
DP2265C	SMD (Circulator)	1805-2170	Φ7	CW	0.6/0.8	15	15	25	200
DP2154C	SMD (Circulator)	1805-2200	Φ10.2	CCW	0.35/0.45	19	19	50	300
DP2133C	SMD (Circulator)	1805-2170	Φ25.4	CCW	0.15	23	23	200	1500
DP2134C	SMD (Circulator)	1805-2170	Φ25.4	CW	0.15	23	23	200	1500
DP0225S	Drop In (Isolator)	1805-2170	31.8*31.8	CCW	0.18	23	23	300	2400
DP0226S	Drop In (Isolator)	1805-2170	31.8*31.8	CCW	0.18	23	23	300	2400
DP2521C	SMD (Circulator)	1805-2690	Φ28.4	CW	0.4/0.45	14.5/13	14.5/13	200	1500
DP2522C	SMD (Circulator)	1805-2690	Φ28.4	CCW	0.4/0.45	14.5/13	14.5/13	200	1500
DP2525C	SMD (Circulator)	1805-2200	Φ20.4	CW	0.25	22/20	22/20	150	1000
DP2526C	SMD (Circulator)	1805-2200	Φ20.4	CCW	0.25	22/20	22/20	150	1000
DP0885C	Drop In (Circulator)	1805-2700	25.4*25.4	CW	0.75	17	17	150	1500
DP0887C	Drop In (Circulator)	1805-2700	31.8*31.8	CW	0.65	18	18	300	2400
DP0883C	SMD (Circulator)	1805-2600	Φ20.4	CW	0.75	14	14	150	1200

Drop in & SMD (high power) lower IM3 products

Customized services can be supported by requirement. All IM3 tested by: **2x50W@1 MHz Spacing -40 to +120 °C**

Part Number	Product Type	Frequency Band (MHz)	Size (mm)	Direction	Insertion Loss (dB)	IM3 (dBc)	Isolation (dB)	Return Loss (dB)	Forward Power (W)	Peak Power (W)
DP0255S	SMD (Isolator)	758-803	φ25.4	CW	0.25	-80dBc	23	23	300	2400
DP0567S	SMD (Isolator)	758-821	φ25.4	CW	0.25	-75dBc	23	23	300	2400
DP2049S	SMD (Isolator)	925-960	φ25.4	CW	0.25	-80dBc	23	23	200	2000
DP438S	SMD (Isolator)	1805-2170	φ25.4	CCW	0.3	-80dBc	21	21	300	1500
DP2211S	Drop In (Isolator)	791-960	31.8*38.1	CCW	0.3	-75dBc	21	21	250	2500
DP2382S	Drop In (Isolator)	758-894	31.8*38.1	CCW	0.3	-72dBc	21	21	250	2500
DP2116S	Drop In (Isolator)	758-960	31.8*31.8	CCW	0.35	-67dBc	21	21	300	1500

SMD (high power) – (Pre 6G)

- The PNs which could cover **6000MHz ~ 15000MHz** smaller **size 3.8*3.8mm, ϕ 5mm, ϕ 7mm** are available now.

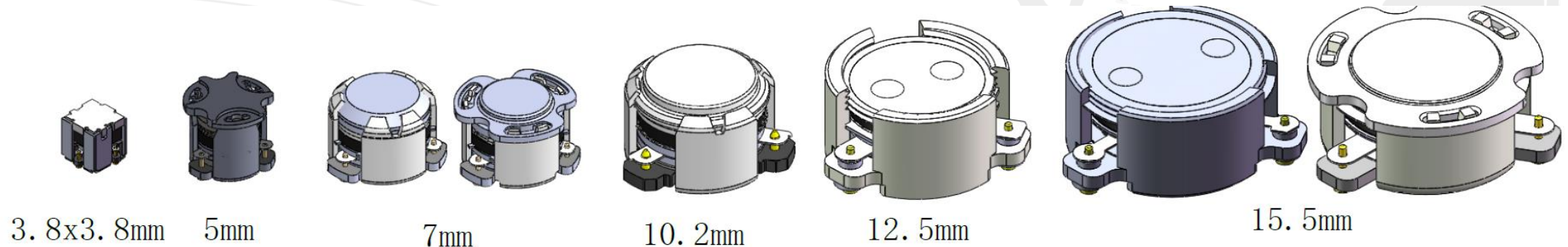
Part Number	Product Type	Frequency Band (MHz)	Size (mm)	Direction	Insertion Loss (dB)	Isolation (dB)	Return Loss (dB)	Forward Power (W)	Peak Power (W)
DP2131C	SMD (Circulator)	6425-6825	ϕ 7	CW	0.35	20	20	30	80
DP2132C	SMD (Circulator)	6425-6825	ϕ 7	CCW	0.35	20	20	30	80
DP2585C	SMD (Circulator)	6500-7100	ϕ 7	CW	0.35	20	20	10	80
DP2586C	SMD (Circulator)	6500-7100	ϕ 7	CCW	0.35	20	20	10	80
DP2587C	SMD (Circulator)	7100-8500	ϕ 7	CW	0.35	20	20	10	80
DP2588C	SMD (Circulator)	7100-8500	ϕ 7	CCW	0.35	20	20	10	80
DP2607C	SMD (Circulator)	6500-7100	ϕ 5	CW	0.45	20	20	10	80
DP2608C	SMD (Circulator)	6500-7100	ϕ 5	CCW	0.55	20	20	10	80
DP2609C	SMD (Circulator)	7100-8500	ϕ 5	CW	0.45	20	20	10	80
DP2610C	SMD (Circulator)	7100-8500	ϕ 5	CCW	0.55	20	20	10	80
DP0495C	SMD (Circulator)	6400-6800	3.8x3.8	CW	0.45/0.6	18	18	3	20
DP0496C	SMD (Circulator)	6400-6800	3.8x3.8	CCW	0.45/0.6	18	18	3	20

SMD (high power) Smaller products ($\phi 5\text{mm}$ & $3.8 \times 3.8\text{mm}$ Series)

Size: $\phi 5\text{mm}$ & $3.8\text{mm} \times 3.8\text{mm}$

Part Number	Product Type	Frequency Band (MHz)	Size (mm)	Direction	Insertion Loss (dB)	Isolation (dB)	Return Loss (dB)	Forward Power (W)	Peak Power (W)
DP2303C	Circulator	2300-2400	$\phi 5$	CW	0.5	17	17	10	100
DP0895C	Circulator	2496-2690	$\phi 5$	CW	0.7	17	17	10	100
DP0897C	Circulator	3400-3600	$\phi 5$	CW	0.6	18	18	10	100
DP0899C	Circulator	3400-3800	$\phi 5$	CW	0.7	17	17	10	100
DP0901C	Circulator	3500-3700	$\phi 5$	CW	0.6	18	18	10	100
DP0495C	Circulator	6GHz+	3.8×3.8	CW	0.6	18	18	3	20

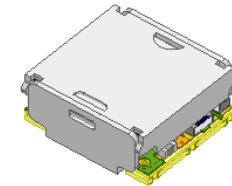
- Currently $\phi 7\text{mm}$ is the smallest size in mass production, $\phi 5\text{mm}$ & $3.8\text{mm} \times 3.8\text{mm}$ are the newest product series in process, and the more smaller products in pre-research.



Circulator & Isolator

Low power models

Part Number	Frequency	Center frequency	Insertion loss	Isolation	Return loss	Handling power	Reflection power	Size[W*L*T]	
	(MHz)	(MHz)	(dB)	(dB)	(dB)	(W)	(W)	W*L[mm]	T[mm]
	-	-	Max.	Min	Max.	Max	Max	±0.3	±0.2
DP-IL0520(A&B)634	617-652	634.5	1.30	9	11	5	2	5*5	2
DP-IL0520(A&B)748	729-768	748.5	1.30	9	11	5	2	5*5	2
DP-IL0520(A&B)780	758-803	780.5	1.20	11	11	5	2	5*5	2
DP-IL0520(A&B)806	791-821	806	1.10	11	11	5	2	5*5	2
DP-IL0520(A&B)873	852-894	873	1.10	10	11	5	2	5*5	2
DP-IL0520(A&B)942	925-960	942.5	0.90	13	13	5	2	5*5	2
DP-IL0520(A&B)1842	1805-1880	1842.5	0.80	14	14	5	2	5*5	2
DP-IL0520(A&B)1900	1880-1920	1900	0.65	14	14	5	2	5*5	2
DP-IL0520(A&B)1960	1930-1990	1960	0.65	14	14	5	2	5*5	2
DP-IL0520(A&B)1962	1930-1995	1962.5	0.70	14	14	5	2	5*5	2
DP-IL0520(A&B)2140	2110-2170	2140	0.65	14	14	5	2	5*5	2
DP-IL0520(A&B)2155	2110-2200	2155	0.70	14	14	5	2	5*5	2
DP-IL0520(A&B)2350	2300-2400	2350	0.70	14	14	5	2	5*5	2
DP-IL0520(A&B)2593	2496-2690	2593	0.80	12	12	5	2	5*5	2
DP-IL0520(A&B)2655	2620-2690	2655	0.65	15	14	5	2	5*5	2
DP-IL0520(A&B)3450	3300~3600	3450	0.90	10	12	5	2	5*5	2
DP-IL0520(A&B)3500	3400~3600	3500	0.90	13	12	5	2	5*5	2
DP-IL0520(A&B)3625	3550~3700	3625	0.90	13	12	5	2	5*5	2
DP-IL0520(A&B)3700	3600~3800	3700	0.90	13	12	5	2	5*5	2



5*5mm

Operating temperature range : -40~85°C

For over 75 years, Richardson Electronics has been your industry-leading global provider of engineered solutions. We are an authorized distributor that provides specialized technical expertise and engineered solutions based on our core engineering and manufacturing capabilities. We provide solutions and add value through design-in support, systems integration, prototype design and manufacturing, testing, logistics, and aftermarket technical service and repair-all through our existing global infrastructure.



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