

大普通信产品手册

海外授权经销商

深圳市维拓精电科技有限公司

制作：

审核：

批准：

会签：



Surveillance
& Security



Communication
Network Equipment



Smart Home
Appliances

Product Manual

WTL® is authorized
oversea distributor of
DAPU TELECOM

Crystals/Oscillators/Chips



Server
& PC



AIoT



Industrial
Control



Automotive
Electronics

Dapu Telecom Technology Co., Ltd.

Founded in 2005, Dapu Telecom headquarter is located at Dongguan China, by keeping invest in new technology research and developing, Dapu is a leading company in clock and timing industry by providing advanced products for communication, network, power grid, industrial control, positioning, medical industry, measurement, radar, micro-wave, and consumers industry.

Dapu is always focusing on clock and timing industry, with the full ranges of Clock Products (crystal oscillator, clock module, programmable XO, Timing Equipment), RF Products (Circulator, Isolator), Chipset (RTC, IEEE1588/PTP Chipset, Buffer, PLL, USB2.0), plus providing the professional service, the sales revenue has increased by 30% each year for 5 consecutive years.

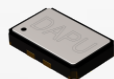
DAPU has 500+ employees, including 25% of senior R&D staffs, keeps no less than 15% of yearly sales revenue reinvesting into new products' innovation, research, development and promotion and has owned 135 PCT patents by the end of 2020.

1

Clock



Crystal



TCXO



OCXO



Clock module



Time Card



Time Device

2

Chipset



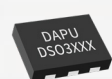
TCXO IC



1588 Clock Chip



RTC



Silicon Oscillator



Buffer



PLL



USB2.0 HUB

3

RF Component



Ferrite



Circulator/Isolator (SMD)



Circulator/Isolator (Drop in)



Low Power Circulator/Isolator

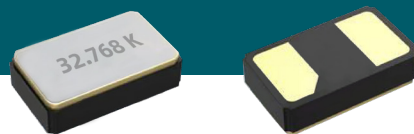
* For more detailed & specific product information which not displayed here, please inquire our sales for further support.

1. Clock Timing Series

- 1.1 32.768kHz Crystals
- 1.2 MHz Crystals
- 1.3 Crystal Oscillators (OSC)
- 1.4 Temperature Compensated Crystal Oscillators (TCXO)
- 1.5 Oven Controlled Crystal Oscillator(OCXO)
- 1.6 Clock Module

➤ 1.1 32.768kHz Crystals

32.768KHz Crystal is a passive electronic component that uses the piezoelectric effect of quartz crystals to generate high-precision oscillation frequencies, mainly used in timing circuits.



Key Features

Ultra-small and ultra-thin package, high-precision.

Main product is 32.768KHz crystal, 1610 size, ± 20 ppm high precision, $-40 \sim +85^{\circ}\text{C}$ operating temperature.

Application

Automotive electronics: Central control instrument, Multimedia entertainment system, Driving recorder, T-BOX, etc.

Smart terminals: Wearable electronic, Mobile phone, Digital camera, Pad, PC, Multi-function calculator, Bluetooth headset, etc.

Smart home appliances: Air conditioner, Refrigerator, Washing machine, Rice cooker, Water heater, etc.

Smart home: Smart lock, Sweeping robot, etc.

Smart office: Attendance Machine, POS machine, etc.

Communication devices: Switch, Server, etc.

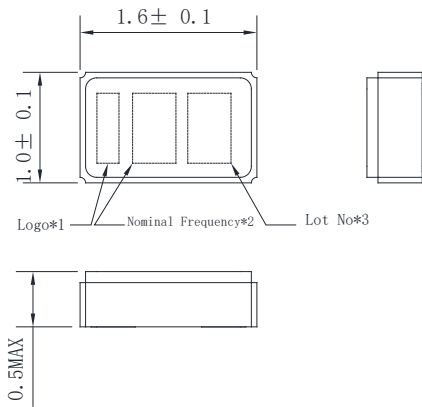
Security buildings: IPC, Access control, Smoke detector, etc.

Meters: Electric meter, Water meter, Gas meter, etc.

Crystals (Frequency Range kHz)

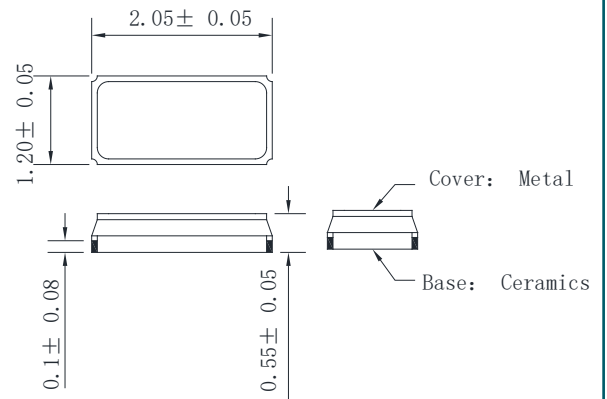
Part Number	Package(mm)	Frequency Range (kHz)	Frequency Accuracy @25°C(ppm)	Operating Temperature (°C)	Load Capacitance (pF)
kHz Crystal Series	1.60×1.00×0.45	32.768	± 20	$-40 \sim +85$	4.0/6.0/7.0/9.0/12.5
	2.00×1.20×0.55	32.768	± 20	$-40 \sim +85$ $-40 \sim +125$	6.0/7.0/9.0/12.5
	3.20×1.50×0.80	32.768	± 20	$-40 \sim +85$ $-40 \sim +125$	6.0/7.0/9.0/12.5

1610



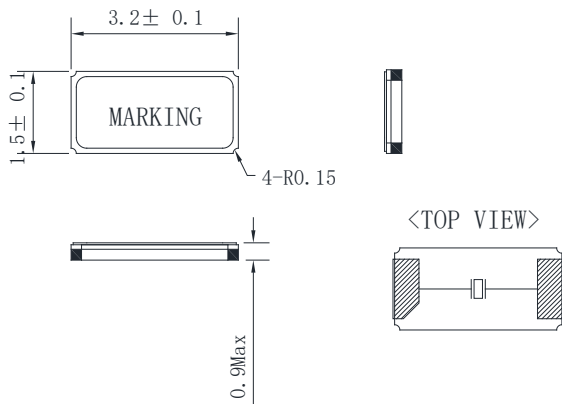
unit:mm

2012



unit:mm

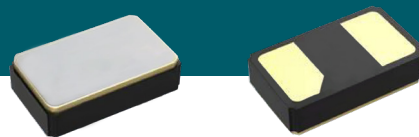
3215



unit:mm

➤ 1.2 MHz Crystals

MHz Crystal is a passive electronic component that uses the piezoelectric effect of quartz crystals to generate high-precision oscillation frequencies, mainly used to provide circuit reference clock source.



Key Features

Ultra-small and ultra-thin size, low power consumption, high accuracy, high-precision, SMD package

Application

Automotive electronics: Central control instrumentation, Multimedia entertainment system, Driving recorder, T-BOX, etc.

Smart terminals: Wearable electronic, Mobile phone, Digital camera, Pad, PC, Multi-function calculator, Bluetooth head set, etc.

Smart home appliances: Air conditioner, Refrigerator, washing machine, Rice cooker, Water heater, etc.

Smart home: Smart lock, Sweeping robot, etc.

Smart office: Attendance machine, POS machine, etc.

Communication devices: Witch, Server, etc.

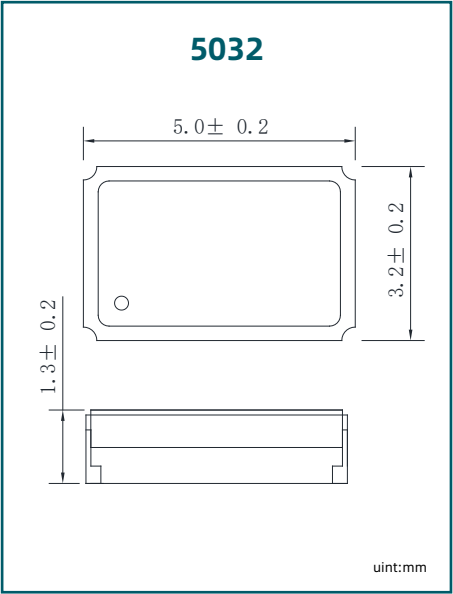
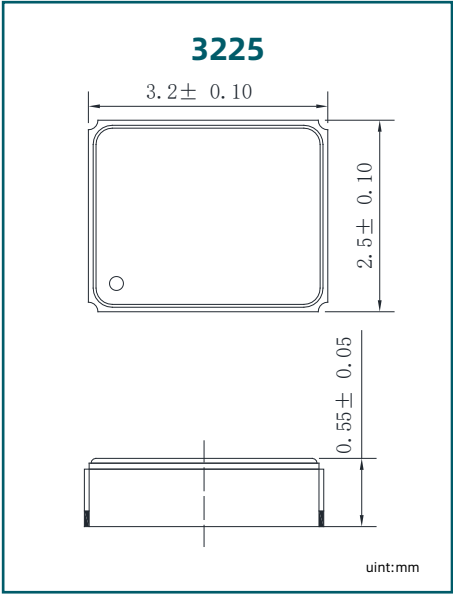
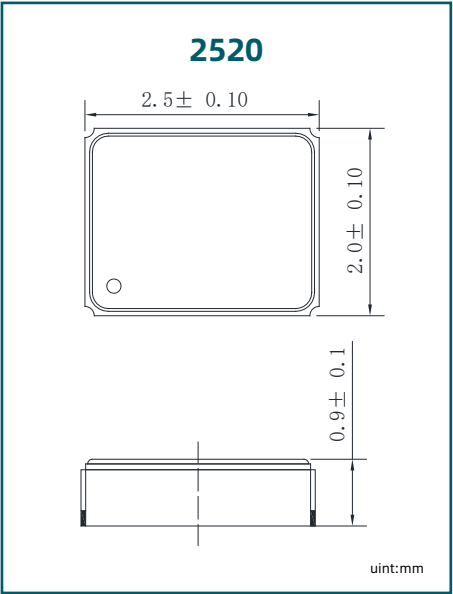
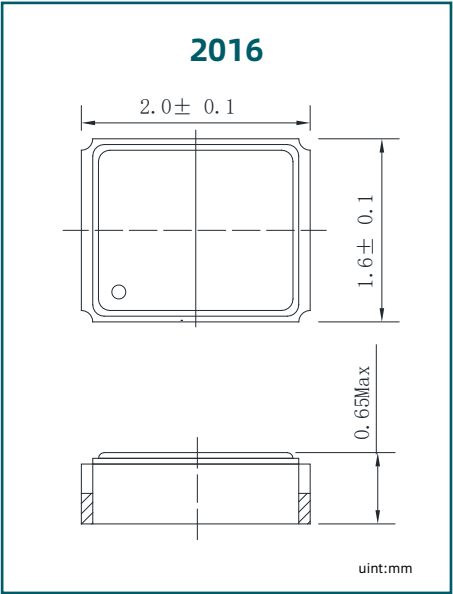
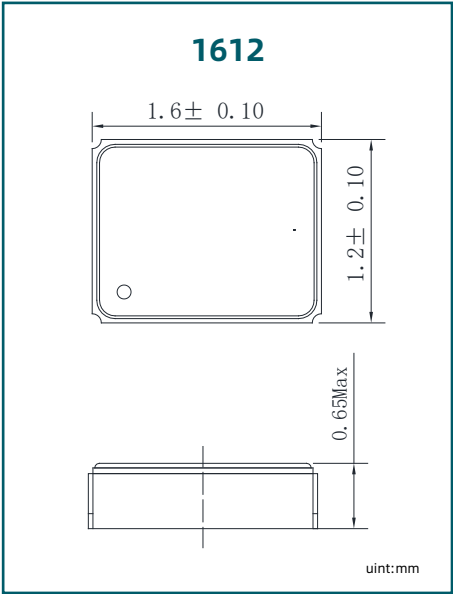
Security buildings: IPC, Access control, Smoke detector, etc.

Meters: Electric meter, Water meter, Gas meter, etc.

Crystals (Frequency Range MHz)

Part Number	Dimensions (mm)	Frequency Range(MHz)	Frequency Accuracy @25°C(ppm)	Operating Temperate (°C)	Load Capacitance (pF)	Recommended Frequency (MHz)
MHz Crystal Series	1.60×1.20×0.30	24 ~ 80	±15/50	-30 ~ +85 -30 ~ +125	8	12.00 12.288
	2.00×1.60×0.45	16 ~ 80	±10/15/50	-30 ~ +85 -30 ~ +125	7/8	16.00 19.20
	2.50×2.00×0.50	16 ~ 80	±10/15	-40 ~ +85	7/8	20.00 25.00
	3.20×2.50×0.50	7.98~150	±10/15/50	-40 ~ +85 -40 ~ +125	8/10	26.00 38.40
	5.00×3.20×1.30	8~55	±15/20/50	-40 ~ +85 -40 ~ +125	8	40.00 48.00 52.00etc.

Package



➤ 1.3 Crystal Oscillators (OSC)

Crystal Oscillator is an active device integrated both crystal resonator and oscillator circuit. It outputs single or differential frequency signals to provide reference clock for the electric circuit.



Key Features

Ultra-small & thin size, wider operating temperature, low jitter, high stability, full package series available.

Applications

Automotive: Audio, Navigation, GPS, Clock, IPC, Radar, etc.

Smart electronics: Digital camera, Pad, PC, etc.

Smart Home Appliances: Air conditioner, Refrigerator, Wash machine, Electric Cooker, Water Heater, etc.

Industrial Controls: Robot, Instrument & apparatus, etc.

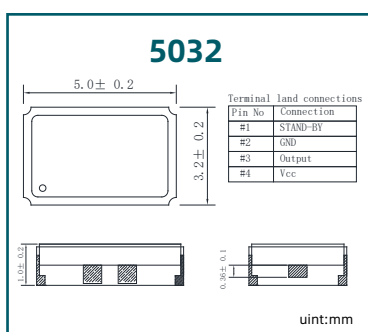
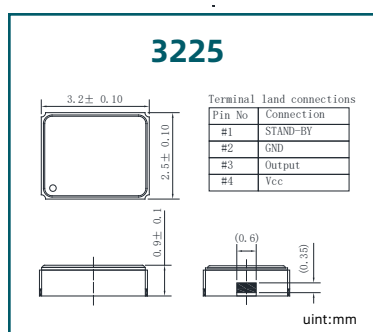
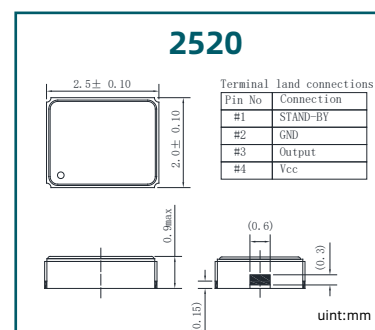
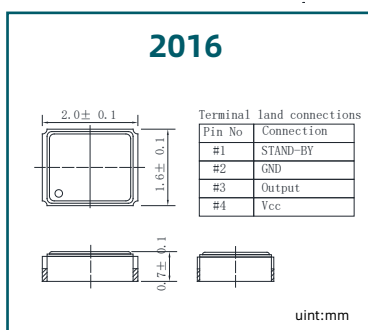
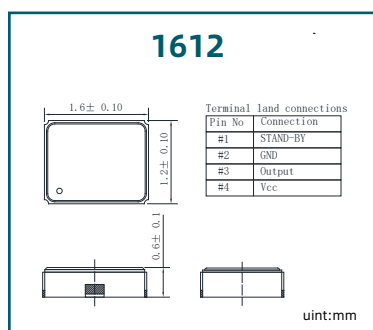
Telecom equipment: Small cell, Walkie talkie.

Digital communications: Optical module, Router, Optical communication, Switch, etc.

Single Output

Part Number	Package(mm)	Frequency Range (MHZ)	Total Frequency Tolerance(ppm)	Operating Temperature (°C)	Recommended Frequency (MHz)
OSC (Single output)	1.60×1.20×0.60	32.768kHz* 2~80	±25/50	-40 ~ +85 -40 ~ +125	32.768kHz* 12.00 12.288 16.00 16.384
	2.00 × 1.60 × 0.70	32.768kHz* 1.5~60	±25/50	-40 ~ +85 -40 ~ +125	24.00 25.00 32.00
	2.50 × 2.00 × 0.90	32.768kHz* 1.5~60	±25/50	-40 ~ +85 -40 ~ +125	48.00 50.00 54.00
	3.20 × 2.50 × 0.90	32.768kHz* 1.5~80	±25/50	-40 ~ +85 -40 ~ +125	125.00etc.
	5.00×3.20×1.00	2.5~125	±25/50	-40 ~ +85 -40 ~ +105	

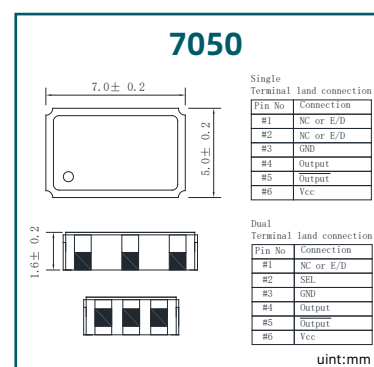
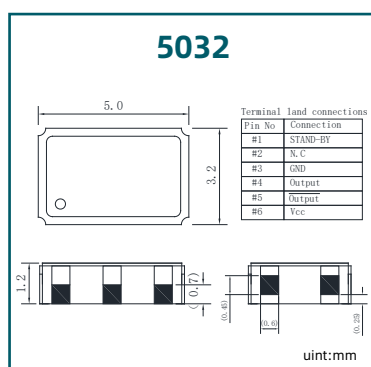
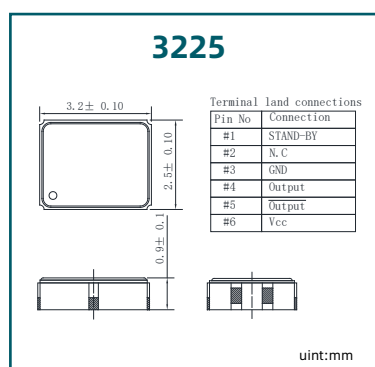
Package



Differential Output

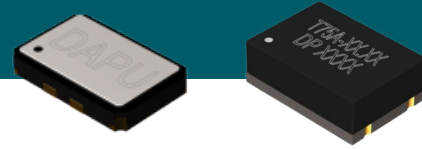
Part Number	Package(mm)	Frequency Range (MHZ)	Total frequency Tolerance(ppm)	Operating Temperate (°C)	Output Waveform	Recommended Frequency (MHz)
OSC (Differential output)	3.2×2.5×0.9	50~220	±50	-40 ~ +85 -40 ~ +105	LVPECL/LVDS /HCSL	100~175MHz
	5.0×3.2×1.2	100~170	±25/50/100	-40 ~ +85	LVPECL/LVDS /HCSL	
	7.0×5.0×1.7	62.5~220	±25/50/100	-40 ~ +85	LVPECL/LVDS	

Package



➤ 1.4 Temperature Compensated Crystal Oscillators (TCXO)

TCXO is a crystal oscillator to output high precise frequency by offsetting frequency shift through compensating the environment temperature variations.



Key Features

High stability, Low phase noise, Super wide operating temperature range, product available in series, supporting customization.

Applications

Telecom equipment: Transmission network (PTN/OTN), Access network (Xpon, DSLAM), BBU/RRU/AAU, Base station.

Private network: Rail transportation, Trunked communication, Navigation system.

Industrial control: Robot, CNC machine, Signal acquisition, etc.

Instrument & apparatus: Testing instrument, Industrial metrology (water meter, energy meter, gas meter).

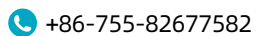
Consumer electronics: Children watch, Mobile phone for old, Navigation module, Blue tooth module, etc.

Super Wide Operating Temperature, Low Phase Noise, High Stability

Part Number	Frequency Range (MHz)	Temperature Stability (ppm)	Aging	Phase Noise (dBc/Hz@1K)	Operating Temperature (°C)	Dimensions (mm)
T75	9.60 ~ 54.00	±0.05	±5 ppb/Day ±1 ppm/Year	-145	-40 ~ +105	SMD 7.0*5.0*2.2
T53	9.60 ~ 54.00	±0.05	±5 ppb/Day ±1 ppm/Year	-145	-40 ~ +105	SMD 5.0*3.2*2.0

Small Package , Low Power Consumption

Part Number	Frequency Range (MHz)	Temperature Stability (ppm)	Aging	Phase Noise (dBc/Hz@1K)	Operating Temperature (°C)	Dimensions (mm)
T32	9.60 ~ 54.00	±0.1	±20 ppb/Day ±1 ppm/Year	-140	-40 ~ +85	SMD 3.2*2.5*0.9
T22	9.60 ~ 52.00	±0.28	±20 ppb/Day ±1 ppm/Year	-140	-40 ~ +85	SMD 2.5*2.0*0.8
T21	9.60 ~ 52.00	±0.5	±20 ppb/Day ±1 ppm/Year	-140	-40 ~ +85	SMD 2.0*1.6*0.7



➤ 1.5 Oven Controlled Crystal Oscillator (OCXO)

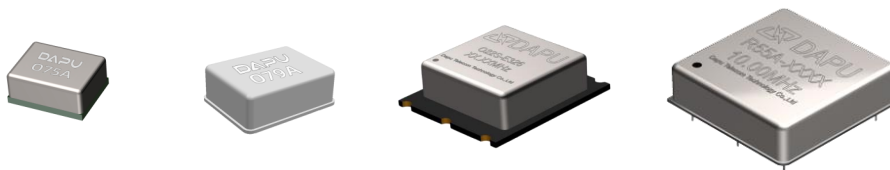
OCXO is a crystal oscillator that uses an oven-controlled oven to keep the temperature of the crystal oscillator or crystal resonator constant, and minimizes the change in the output frequency of the oscillator caused by changes in ambient temperature.

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



◆ 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 low phase noise | 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	DIP 25.0*22.0*12.0	...

◆ Small package | wide temperature | high vibration resistance | low power consumption | 3E clock

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	$\pm 0.5/\pm 1/\pm 3/\pm 5/\pm 10$	± 1 ppb/Day ± 100 ppb/Year	-160	0.5ppb/G	-55 - 105	SMD 14.4*9.5*8.0	10.00 12.80 19.20 20.00 25.00 38.88 ...
O97	10 - 100.00	$\pm 0.5/\pm 3/\pm 5/\pm 10/\pm 20$	± 3 ppb/Day ± 0.3 ppm/Year	-160	0.2ppb/G	-55 - 105	SMD 9.7*7.5*3.9	...
O75	10 - 100.00	$\pm 10/\pm 20$	± 3 ppb/Day ± 0.3 ppm/Year	-160	0.5ppb/G	-55 - 105	SMD 7.5*5.5*3.3	...

➤ 1.6 Clock Module

CMXX series is highly integrated clock module product integrating crystal oscillator and clock algorithm. Choose the appropriate clock type and accuracy according to different indicators of maintaining punctuality, combine the features of each crystal oscillator, optimize clock algorithm parameters, achieve cost-effective solutions.

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: $\pm 0.01\text{ppb}$
- 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



◆ 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	$\pm 5\mu\text{s}/1\text{ H } (\Delta T = \pm 2^\circ\text{C})$	± 50	-138	-40 ~ 105	SMD 10.0*10.0*2.2

◆ Built in OCXO | ultra wide precision

Product series	Synchronization accuracy (ns)	Holdover ability	Temperature Stability (ppb)	Phase Noise (dBc/Hz@1K)	Operating Temperature (°C)	Size (mm)
CM11H	± 50	$\pm 12\mu\text{s}/12\text{H } (\Delta T = \pm 15^\circ\text{C})$	± 0.5	-160	-40 ~ 85	DIP 14.4*9.5*7.0mm,
CM22	± 50	$\pm 1.5\mu\text{s}/8\text{H } (\Delta T = \pm 10^\circ\text{C})$	± 0.3	-155	-40 ~ 85	DIP 20.2*20.2*9.0
CM55	± 30	$\pm 1.5\mu\text{s}/24\text{H } (\Delta T = \pm 15^\circ\text{C})$	± 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	$\pm 1.5\mu\text{s}/24\text{H } (\Delta T = \pm 15^\circ\text{C})$	± 0.1	-155	-40 ~ 85	DIP 60.0*60.0*13.0

◆ Built in OCXO + 1588 Chip

Product series	Synchronization accuracy (ns)	Holdover ability	Temperature Stability (ppb)	Input/Output	Operating Temperature (°C)	Size (mm)
CM35P	± 50	$\pm 1.5\mu\text{s}/8\text{H } (\Delta T = \pm 5^\circ\text{C})$	Dual SGMII	1pps/TOD/IPCLK input 1pps/10M/TOD/OPCLK output	-20 ~ 75	SMD 40.0*35.0*13.0

2. Clock Chip Series

- 2.1 Real Time Clock (RTC)
- 2.2 Clock Buffers
- 2.3 Silicon Oscillators
- 2.4 IEEE1588/PTP chip

➤ 2.1 Real Time Clock (RTC)

RTC is an integrated circuit chip that provides accurate time for electronic products or provides an accurate time reference for electronic systems.



Key Features

Built in 32.768KHz crystal, accuracy up to ± 2 ppm, has multiple functions of I2C bus interface, calendar function (year, month, week, day, hour, minute, second, 1/16 second), leap years autocorrection, backup battery, power auto switchover, timer, frequency output.

Applications

Security monitoring/Security: IPC, DVR, NVR, Smart lock, Access control system, etc.

Consumer Electronics: Notebook, Pad, PC, etc.

Communication network: Base stations, Switch/PBX, etc.

Automotive electronics: T-BOX, Commercial vehicle IPC, Taxi meter, Driving recorder, Vehicle instrument, etc.

Meter: Electric meter, Water meter, Gas meter, etc.

Smart home: HEMS home energy management system, Smart thermostat, Sweeper, Water heater, Smart socket, etc.

Industrial automation: Robotic arm, PLC motor servo, Human-machine interface HMI, Servo controller, etc.

Medical/office appliance/testing and measurement: Oximeter, Medical monitor, Endoscope, Attendance machine, Multifunction printer (MFP), etc.

High Accuracy RTC

Part Number	Built-in Crystal	Accuracy	Typical Power Consumption	Dimensions	Backup Power Support	State
INS5609	Yes	± 5 ppm@-20°C ~ +70°C ± 20 ppm@-40°C ~ -20°C ± 20 ppm@+70°C ~ +85°C	0.7 uA	3.2*2.5*1.0mm	Yes	●
INS5699S	Yes	± 5 ppm@-40°C ~ +85°C	0.5 uA	3.2*2.5*1.0mm	Yes	●

RTC

Part Number	Built-in Crystal	Accuracy	Typical Power Consumption	Dimensions	Backup Power Support	State
INS5710A	Yes	5 $\pm$ 23ppm@25°C	0.5 uA	SOP8 4.9* 6.0* 1.6mm	No	●
INS5830A	Yes	5 $\pm$ 23ppm@25°C	0.5 uA	3.2*2.5*1.0mm	Yes	●

Lower Power Consumption RTC

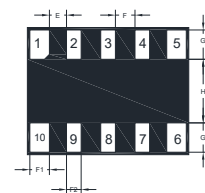
Part Number	Built-in Crystal	Accuracy	Typical Power Consumption	Dimensions	Backup Power Support	State
INS5903X	Yes	±5ppm@25°C	0.3 uA	3.2*2.5*1.0mm	Yes	○

Automotive Grade RTC

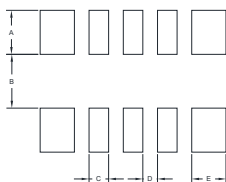
Part Number	Built-in Crystal	Accuracy	Typical Power Consumption	Dimensions	Backup Power Support	State
INS591X	Yes	±8ppm@-40°C ~ +105°C	0.5 uA	3.2*2.5*1.0mm	Yes	○

Package

SMD 3225



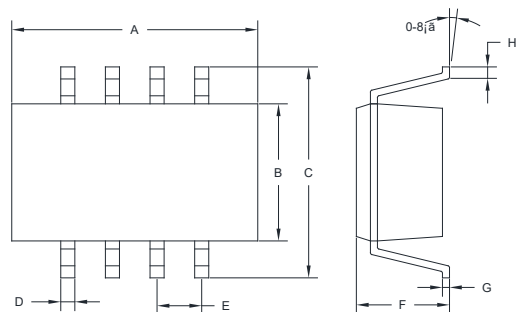
Dimension	Typ.
A	3.2
B	2.5
C	1.0
E	0.35
F	0.4
G	0.6
H	1.3
F1	0.50
F2	0.30



Dimension	Max
A	0.9
B	1.1
C	0.4
D	0.3
E	0.7

unit:mm

SOP8

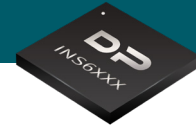


Dimension	Min	Nom	Max
A	4.8	4.9	5.0
B	3.8	3.9	4.0
C	5.8	6.0	6.2
D	0.356	--	0.456
E	--	1.27	--
F	1.3	--	1.6
G	0.203	--	0.233
H	0.4	0.6	0.8

unit:mm

➤ 2.2 Clock Buffers

Buffer is a device allowing the same product to be used across multiple projects and platforms.



Key Features

Ultra-low additive jitter, lower power consumption, support multiple output clock formats from any input clock format includes LVDS、LVPECL、LVCMOS、Crystal.

Applications

Communication Equipment: Switch, Router, MSAN, DSLAM, PON, SONET, SDH device, etc.

Industrial control: High-speed data acquisition card, Servo motor, etc.

Instruments: Signal generator, etc.

Single Output Buffer

Part Number	Output Channels	Output Level	Input Level	Output Voltage	Core Operating Voltage	Additional Jitter	Frequency Range	State
INS6110	10	LVCMOS	LVDS、LVPECL、LVCMOS、Crystal	3.3V、2.5V、1.8V、1.5V	2.5V、3.3V	<50fs	DC~200MHz	●
INS6105	5	LVCMOS	LVDS、LVPECL、LVCMOS、Crystal	3.3V、2.5V、1.8V、1.5V	2.5V、3.3V	<50fs	DC~200MHz	○

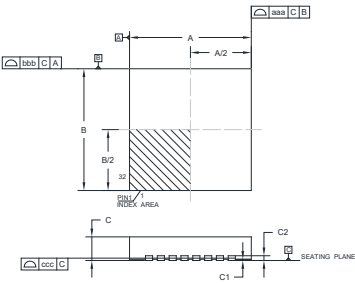
Differential Buffer

Part Number	Output Channels	Output Level	Input Level	Output Voltage	Core Operating Voltage	Additional Jitter	Frequency Range	State
INS6310	10	LVDS、LVPECL、HCSL	LVDS、LVPECL、LVCMOS、Crystal	2.5V、3.3V	2.5V、3.3V	<50fs	DC~3000MHz	○

Configurable Buffer

Part Number	Output Channels	Output Level	Input Level	Output Voltage	Core Operating Voltage	Additional Jitter	Frequency Range	State
INS6234	4	HCSL、LVCMOS	LVDS、LVPECL、LVCMOS、Crystal	2.5V、3.3V	3.3V	<50fs	DC~400MHz	○

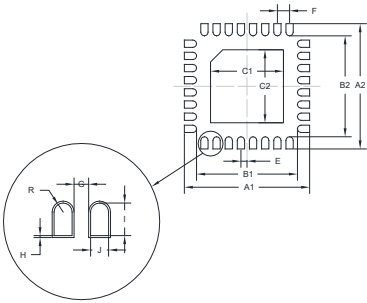
Package



Dimension	Min	Nom	Max
A	4.85	5.00	5.15
B	4.85	5.00	5.15
C	0.80	0.90	1.00
C1	--	--	0.05
C2	--	--	0.20
D	3.05	3.15	3.25
E	2.90	3.00	3.10
F	--	0.50	--
F1	0.30	0.40	0.50
F2	0.18	--	0.30
aaa	--	--	0.15
bbb	--	--	0.10
ccc	--	--	0.08
ddd	--	--	0.10
eee	--	--	0.10

uint:mm

Recommended solder pad:

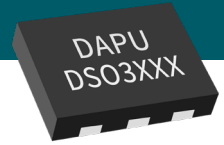


Dimension	Max
A1	5.15
A2	5.15
B1	4.15
B2	4.15
C1	3.00
C2	3.00
E	0.25
F	0.5
G	0.08
H	0.07
I	0.50
J	0.30

uint:mm

➤ 2.3 Silicon Oscillators

Silicon oscillator is a class of oscillators that generate single or differential output frequency signal by using semiconductor devices on an integrated circuit (IC) without quartz & MEMS, which offers designers a reliable and economical timing solution alternative to crystal-based products. These entirely electronic solutions contain no mechanical components and are insensitive to humidity, dirt, vibration, and electromagnetic interference (EMI).



Key Features

Pure chip manufacturing process, strong shock resistance, flexible configuration of output frequency, and support for multiple output formats.

Applications

Communication: Server, Computer, Storage, Switch, Router, High-speed optical module, Network interface card, etc.

Industry: Video Broadcasting, Audio and Video processing, Testing equipment, etc.

Differential/ Single Output Product Series

Part Number	Dimensions (mm)	Frequency Range	Total Frequency Tolerance (ppm)	Operating Temperature (°C)	Output Waveform	Jitter (12 kHz - 20 MHz)
DSO3001 DSO3002 DSO3003	3.2×2.5×0.8 5.0×3.2×0.8	Differential Output: 10KHz~350MHz Single Output: 10KHz~212.5MHz	±50	-40 ~ +85	LVDS, LVPECL, HCSL, CML, LVCMOS OR Dual LVCMOS	350fs

Remarks:

- DSO3001 Discretionary configurations before delivery
- DSO3002 Various configurations by switching pins after delivery
- DSO3003 Free configurations through I2C after delivery.

Package

DSO3001

PIN definition
(LVPECL/LVDS/HCSL/CML/Dual CMOS)

(Top View)
3.2 x 5 mm and 2.5 x 3.2 mm

PIN Number	Description
1,2	Pin optional function OE=Output switch, Active high. ACT=Output driving enable, Active high. NC=Vacant
3	GND=Ground
4	CLK+=Positive output
5	CLK-=Negative output
6	VDD=Power supply

uint:mm

DSO3002

PIN definition
(LVPECL/LVDS/HCSL/CML/Dual CMOS)

(Top View)
3.2 x 5 mm and 2.5 x 3.2 mm

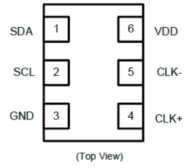
PIN Number	Description
1,2	Pin optional function OE=Output switch, Active high. ACT=Output driving enable, Active high. FC=Configuration switching (three-state level)
3	GND=Ground
4	CLK+=Positive output
5	CLK-=Negative output
6	VDD=Power supply

uint:mm

DSO3003

PIN definition

(LVPECL/VDS/HCS/LCM/Dual CMOS)



3.2 x 5 mm and 2.5 x 3.2 mm

PIN Number	Description
1	SDA=I ² C Data
2	SCL=I ² C Clock
3	GND=Ground
4	CLK+=Positive output
5	CLK-=Negative output
6	VDD=Power supply

unit:mm

Single Output Product Series

Part Number	Dimensions (mm)	Frequency Range	Total frequency Tolerance (ppm)	Operating Temperature (°C)	Output Waveform	Jitter (12 kHz ~20 MHz)
DSO311 DSO312	3.2×2.5×0.8	Single Output: 10KHz~212.5MHz	±50	-40 ~ +85	CMOS	350fs

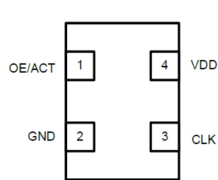
Remarks:

- DSO311 Discretionary configurations before delivery
- DSO312 Various configurations by switching pins after delivery

Package

DSO311

PIN definition



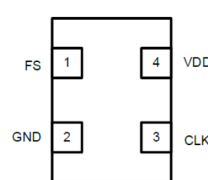
(Top View)
2.5 x 3.2 mm

PIN Number	Description
1	OE=Output switch, Active high. ACT=Output driving enable, Active high.
2	GND=Ground
3	CLK=CMOS clock output
4	VDD=Power supply

unit:mm

DSO312

PIN definition



(Top View)
2.5 x 3.2 mm

PIN Number	Description
1	FS=Configuration switching (three-state level)
2	GND=Ground
3	CLK=CMOS clock output
4	VDD=Power supply

unit:mm

➤ 2.4 IEEE1588/PTP chip

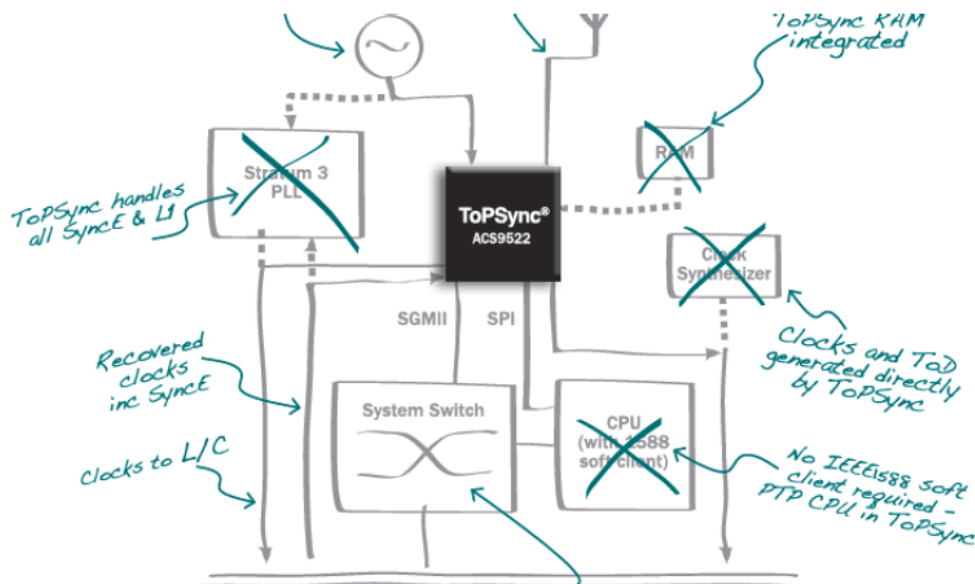
AC952X is the world's first one-chip synchronization system for all telecom timing standards. The DPSync synchronization system-on-a-chip sets a new standard for integration levels in the industry by integrating all functionality required to support implementation of any telecom synchronization standard into a single device, which supports IEEE1588 master, slave and boundary clock, at the same time as SyncE, SONET and SDH.

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



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

3.RF Circulator & Isolator

➤ 3.1 RF Circulator & Isolator

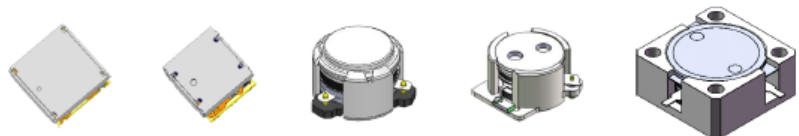
DPXXXC, PDXXXXS is a series of Low insertion loss and low intermodulation distortion circulators/isolators in both SMD and drop-in packages, which can offer good impedance matching performance. The main job of circulator is to ensure that the signal passes without loss in the forward direction, and high isolation prevention of reflected signals.

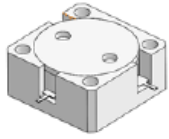
Application

- 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)





Drop In (high power) Circulator & Isolator

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

7

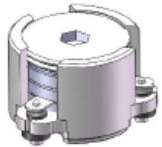
Product Series

45

Package Size

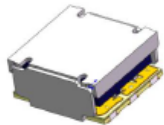
500+

PNs



SMD (high power) Circulator & Isolator

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



SMD (low power) Circulator & Isolator

7mm*7mm、 5mm*5mm、 4mm*4mm ***

Providing a full range of circulator & isolator products (including ferrite, waveguide, microstrip, low power, etc.)
Meeting customers diversified applications & Following customers product evolution

◆ High Power Surface Mount (SMD) Circulator & Isolator

Product Series	Working frequency (MHz)	Dimension (mm)	Power (W)	return loss (dB)	insertion loss (dB)	Isolation (dB)	third-order intermodulation (dBc)
DPxxxxC	200 – 9000	Ø7 – 38.1*38.1	20 – 500	20 Min.	0.15 – 0.35	20 Min.	60 Min.
DPxxxxS	200 – 9000	Ø7 – 38.1*38.1	20 – 500	20 Min.	0.15 – 0.35	20 Min.	60 Min.

◆ Drop In Circulator & Isolator

Product Series	Working frequency (MHz)	Dimension (mm)	Power (W)	return loss (dB)	insertion loss (dB)	Isolation (dB)	third-order intermodulation (dBc)
DPxxxxC	200 – 9000	Ø7 – 38.1*38.1	20 – 500	20 Min.	0.15 – 0.35	20 Min.	60 Min.
DPxxxxS	200 – 9000	Ø7 – 38.1*38.1	20 – 500	20 Min.	0.15 – 0.35	20 Min.	60 Min.

◆ Low Power Surface Mount (SM) Circulator & Isolator

Product Series	Working frequency (MHz)	Dimension (mm)	Power (W)	return loss (dB)	insertion loss (dB)	Isolation (dB)	third-order intermodulation (dBc)
DP-CLxxxxxxx	400 – 5000	7*7/5*5/4*4	10	12 Min.	0.6 – 0.8	12 Min.	50 Min.

φ7mm SMD series for 2.6G & 3.5G

Key parameters	Specification requirements (Ø7mm)	Dapu (Ø7mm)
Frequency (MHz)	2496 ~ 2690	2496 ~ 2690
Isolation (dB)	20	20
Return Loss (dB)	22	22
Insertion Loss (dB)	0.35	0.26
Impedance (Ω)	50	50
3 rd IMD (Max.) (dBc)	-60 (2 x 5W)	-60 (2 x 5W)
2 nd Attenuation (dB)	20	22
Power FWD/REV/PEAK (W)	30/30/150	50/50/200
Operating Temp. (°C)	-40 to +110	-40 to +125



Ø7mm

Key parameters	Specification requirements (Ø7mm)	Dapu (Ø7mm)
Frequency (MHz)	3400 ~ 3600	3400 ~ 3600
Isolation (dB)	20	20
Return Loss (dB)	22	22
Insertion Loss (dB)	0.3	0.23
Impedance (Ω)	50	50
3 rd IMD (Max.) (dBc)	-60 (2 x 5W)	-60 (2 x 5W)
2 nd Attenuation (dB)	20	25
Power FWD/REV/PEAK (W)	30/30/150	50/50/200
Operating Temp. (°C)	-40 to +110	-40 to +125

* Full temperature performance

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

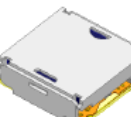
4*4mm



5*5mm



7*7mm



Operating temperature range : -40~85°C



*Quartz Crystal
Always WTL*



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