ALLYSTAR

ALLYSTAR Company Profile

Contents

About ALLYSTAR

ALLYSTAR Company Profile

ALLYSTAR Technology Co., Ltd.

The Internet of everything industry is built by billions of small devices that come from innovation of human beings. Security and Connectivity are major key factors that people are concerned about.

ALLYSTAR Technology creates solutions for the secured and connected world, from which customers across a wide variety of industries are able to differentiate their products through features, cost of ownership and/or time-to-market.

Addition information:
www.allystar.com

About ALLYSTAR

ALLY·STAR

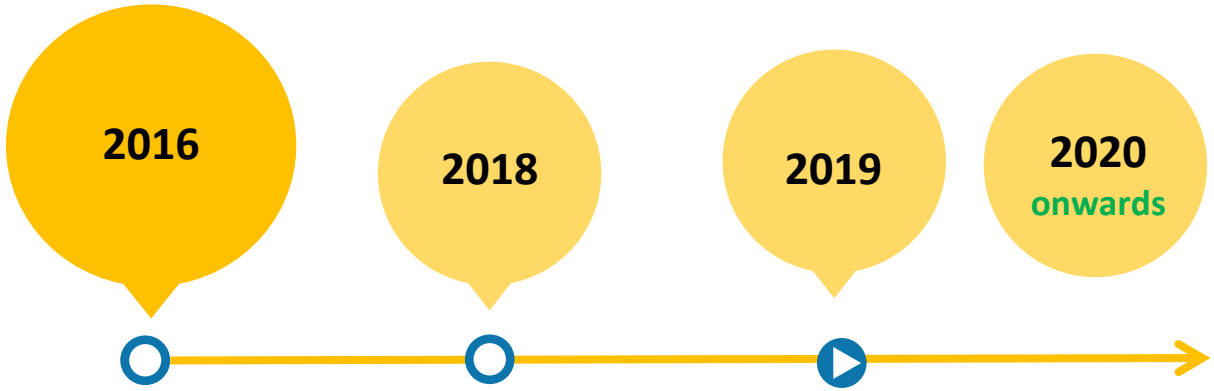
ALLY to associate or connect by some mutual relationship

STAR the truth north, direct to polestar

ALLYSTAR is the group of experienced people in GNSS field to create novel chip/module/algorithm for location technologies

Addition information:
http://www.allystar.com/en/

SHENZHEN / BEIJING / HONG KONG / CALGARY/HSINCHU



2016.12.06
Allystar Technology established

2018.Q2
Multi-band GNSS SOC
GPS/BDS/GLN/GAL
L1/L2/L5/L6

2019.11.01
Finished A round financing

Complete GNSS team with GNSS RF/BB/ALGM and AE experts to provide chip/module solutions

Multi-culture GNSS team with people from China (mainland China, Hong Kong, and Taiwan), Canada, and India

Pioneer GNSS team with leading multi-band GNSS product which supports L1/L2/L5/L6 signals

Location Solution Provider

Founded
December, 2016

Headquarter
Shenzhen, China

President
Simon Sun

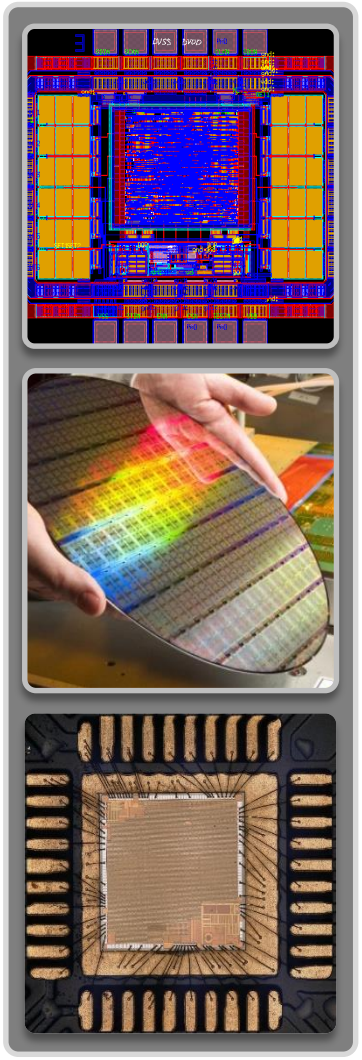
Capital
US100M

Employee
150

Core Activities
Design of location awareness technologies and solutions

Product Lineup
Cynosure Series GNSS SoC
Cynosure GNSS MCU (GNMCU)
Cynosure HDK/SDK Platform
Logistic Security Management Solution

Leading GNSS Supplier



Shenzhen **First**

Location Chipset Supplier
(GPS/BDS/GLO/GAL/QZSS/IRNSS)

China **Only**

Top 3 Rank by ABI Research
(Innovation Field)

Worldwide **Pioneer**

GNSS SOC
Multi-GNSS, Multi-Frequency
(GPS/BDS/GLO/GAL/QZSS/IRNSS)
New Beidou-3 System

ABIresearch
technology market intelligence

2015
2016
2017

TOP 10

1st

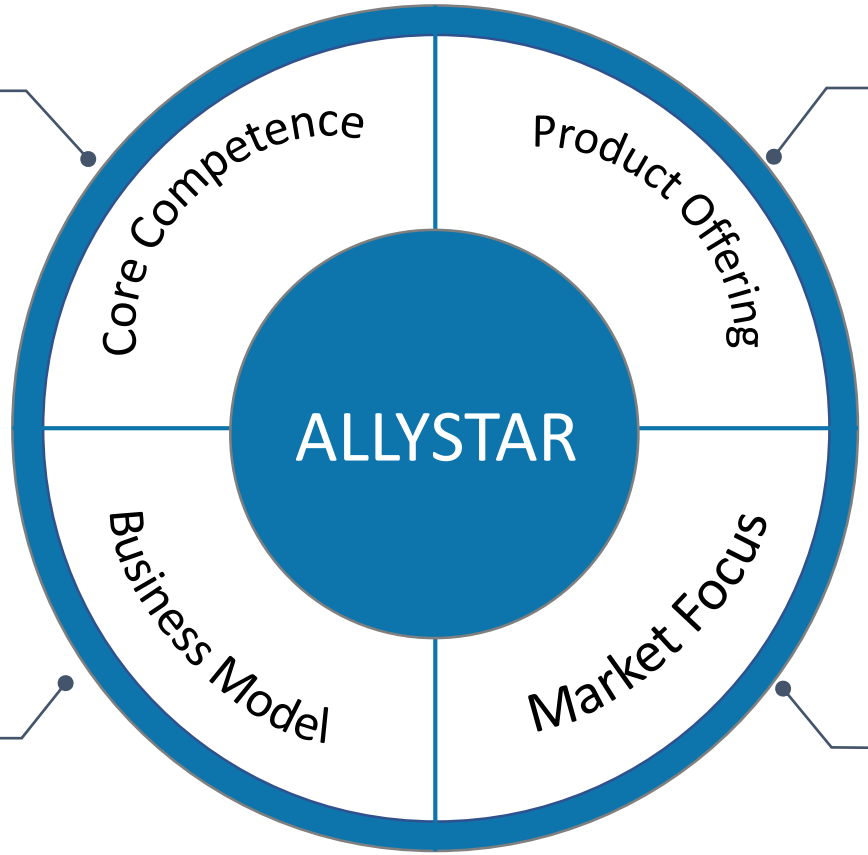
GLOBAL
BeiDou-3
Multi-GNSS
Multi-band

北斗芯片开放平台
BD Chipset Open Platform

GNSS Open Platform

Value Proposition

- Location Awareness
- Secure Logistic Mngt

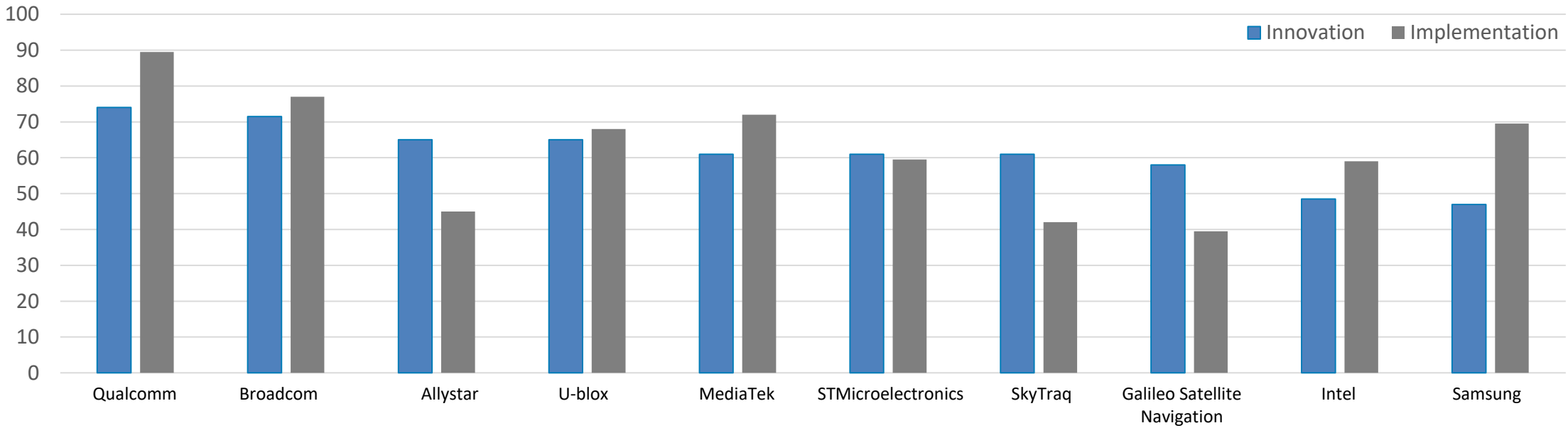


- Integrated circuit
- Integration system

- Fabless design house
- Link whole value chain

- Consumer products
- Automotive products

Top 3 Innovation Assessment by ABI



Source: "GNSS IC Vendors - 4Q 2016 (CA-1222)", ABI Research

ALLYSTAR's competitiveness at ABI Research report

- Only one company in China listed in this ranking
- Rank 3 in "innovation" aspect
- Rank 7 in overall evaluation

ALLYSTAR's competitiveness at GSA GNSS

Consumer Solutions Value Chain

COMPONENTS AND RECEIVER MANUFACTURERS	OPERATING SYSTEM DEVELOPERS	DEVICE INTEGRATORS AND VENDORS	SERVICE & CONTENT PROVIDERS	APP DEVELOPERS/ RETAILERS	APP STORES	USERS
• ANALOG DEVICES • ALLYSTAR • BROADCOM • HISILICON • INFINEON* • INTEL • MEDIATEK • NIHON DEMPA KOGYO • QUALCOMM • SAMSUNG • SEIKO EPSON • SPREADTRUM COMMUNICATIONS • SONY • U-BLOX*	• APPLE (iOS) • CANONICAL* (UBUNTU) • GOOGLE (ANDROID) • JOLLA* (SAILFISH) • LINUX FOUNDATION (LINUX) • MICROSOFT (WINDOWS)	**Smartphone/Tablets:** APPLE, BLACKBERRY LIMITED, BQ*, DORO, HTC, HUAWEI, LENOVO, LG, MALATA, MICROSOFT, OPPO, SAMSUNG, VIVO, XIAOMI, ZTE, ONEPLUS, SONY, NOKIA **Wearables:** APPLE, CITIZEN, FITBIT, GARMIN, MICROSOFT, POLAR, SUUNTO*, SAMSUNG, TIMEX*, XIAOMI, AMER SPORTS* **People Tracking:** GARMIN, POCKET FINDER, SPOT, TELTONIKA **Original Design Manufacturers:** AVNET, COMPAL				

Products & Solutions

ALLYSTAR Company Profile

GNSS Market & Applications

Navigation Market -- Meter Precision

Vehicle

Marine

Engineering

Fleet Management

Wearable devices

Logistics

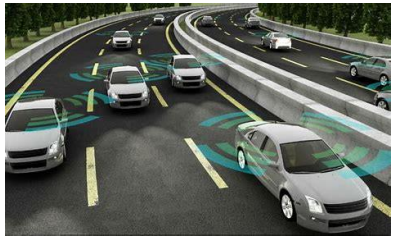
High Precision Market -- Sub-meter Precision

Aviation

Agriculture

Machine Control

Drone



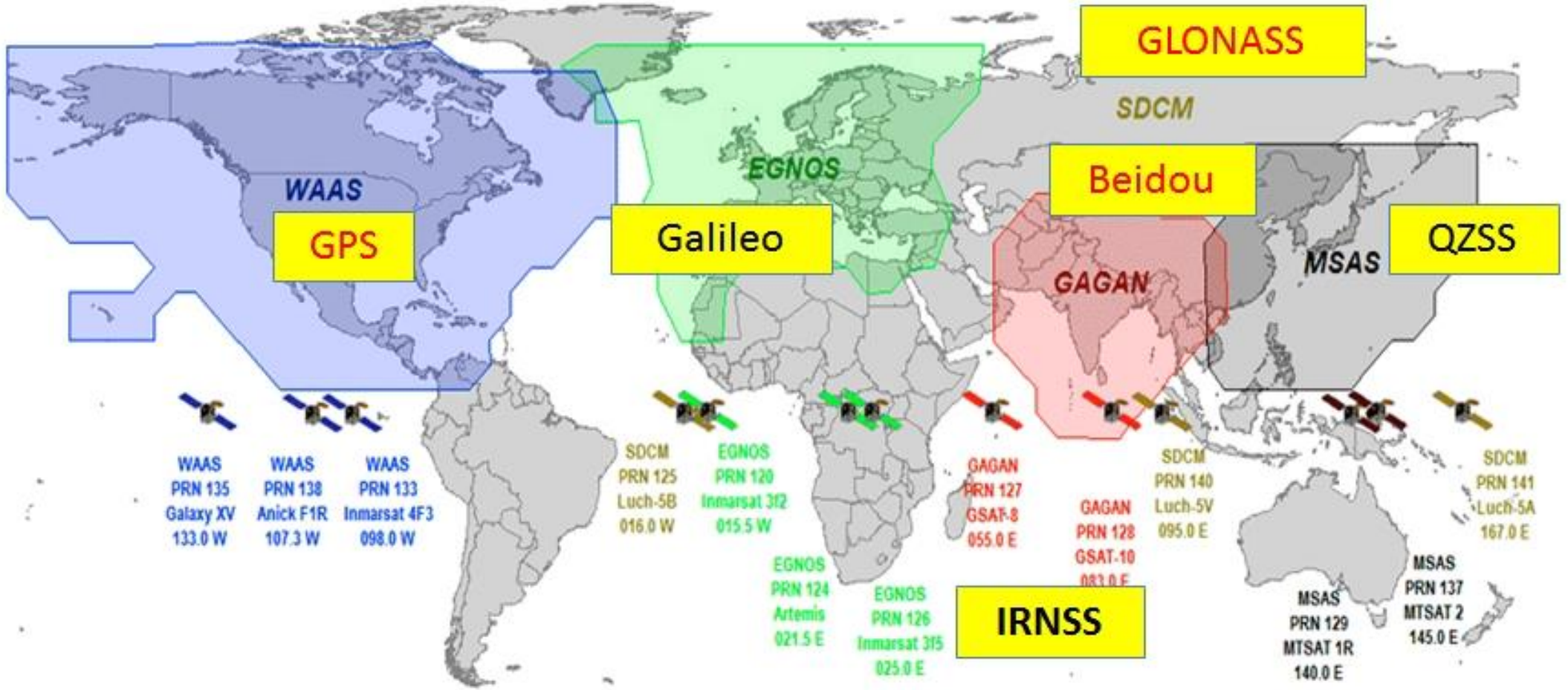
Self-Driving

Survey

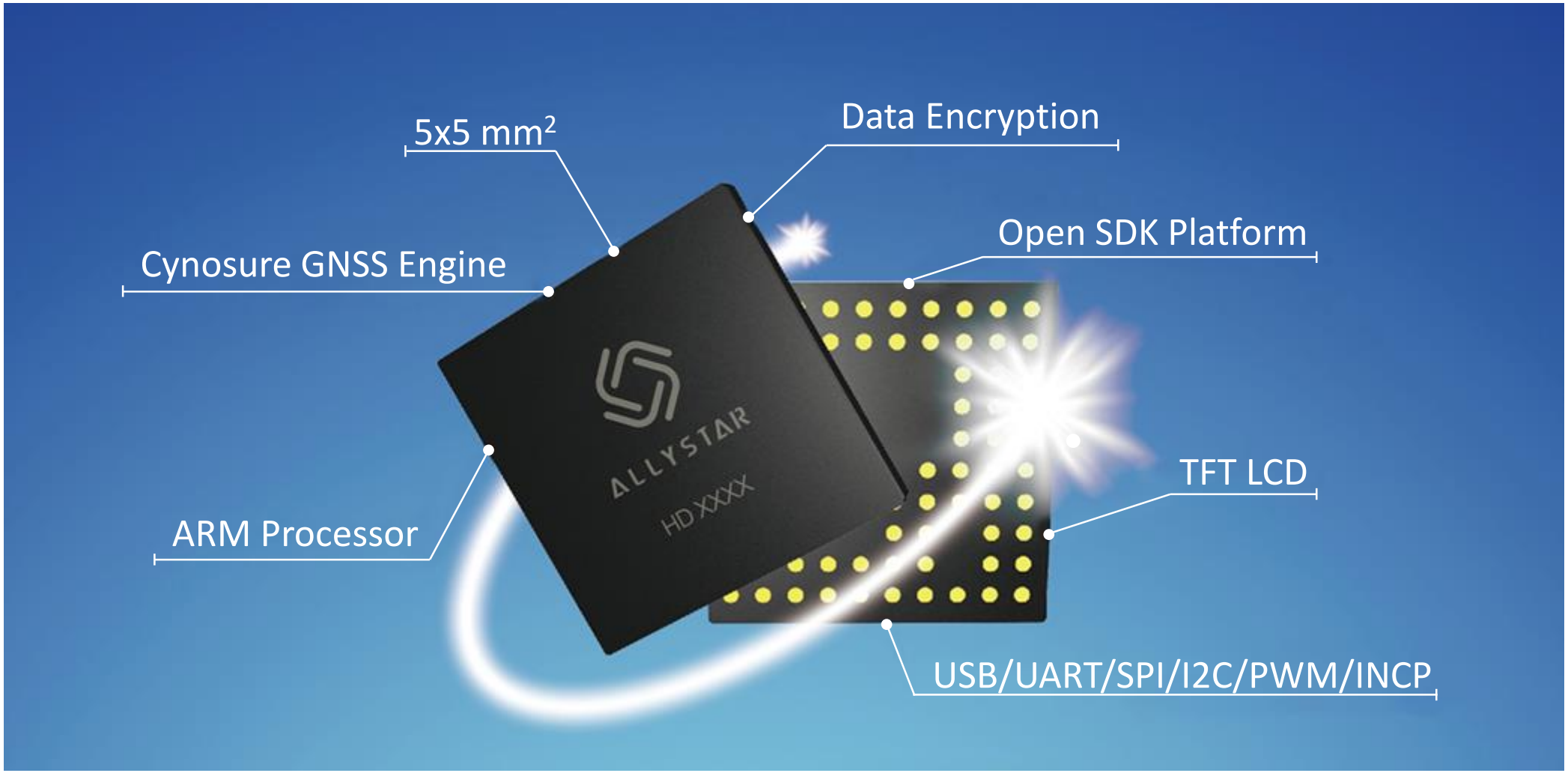
10m 5m 2m 1m 1cm 1mm

GNSS Around the World

6 major satellite systems & 4 augmentation satellite systems

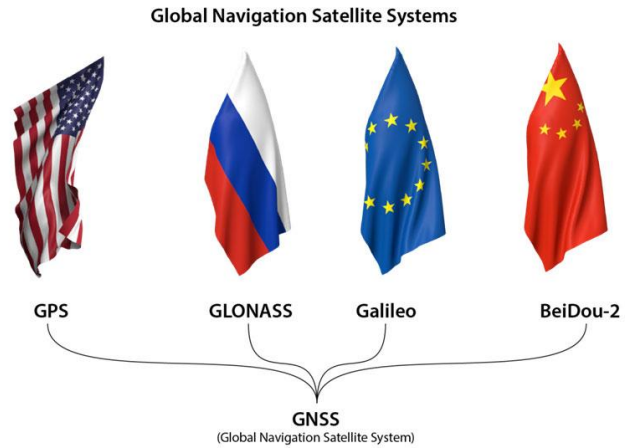


ALLYSTAR GNSS Product (Cynosure Series)



Unique Chip-Level Data Protection

First GNSS with Security Certification



ATM Card Level Protection Mechanism

Secure GNSS for IOT/IOV

EAL4+ Security Technology

Chinese SM4 Algorithm

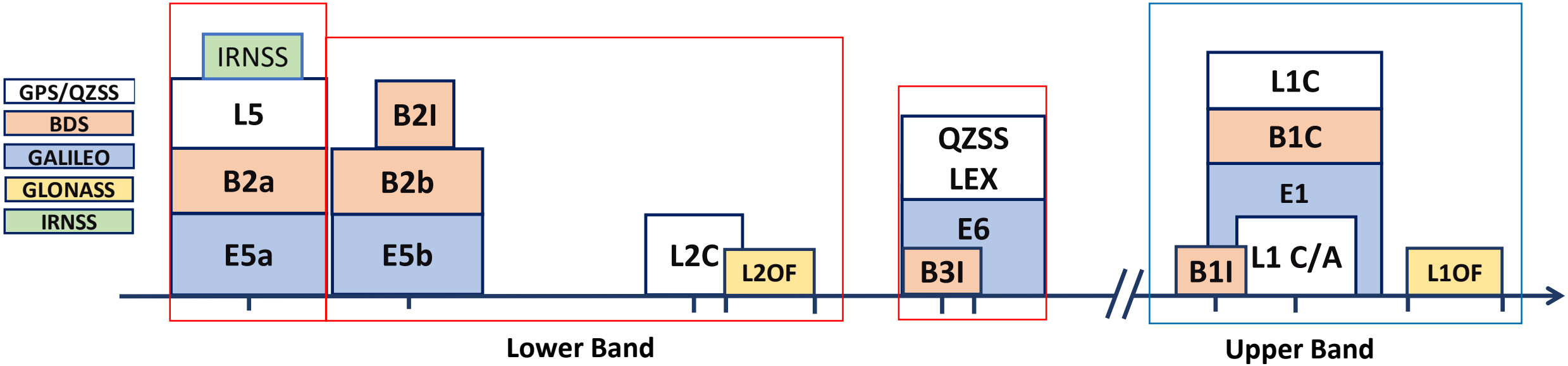
International AES / DES Algorithm

Secure-Management Solution

Multi-Band GNSS SoC Solution

Cynosure GNSS Design Concept : Lower Band + Upper Band

Dual band GNSS receiver to cover all constellations in all bands for different applications

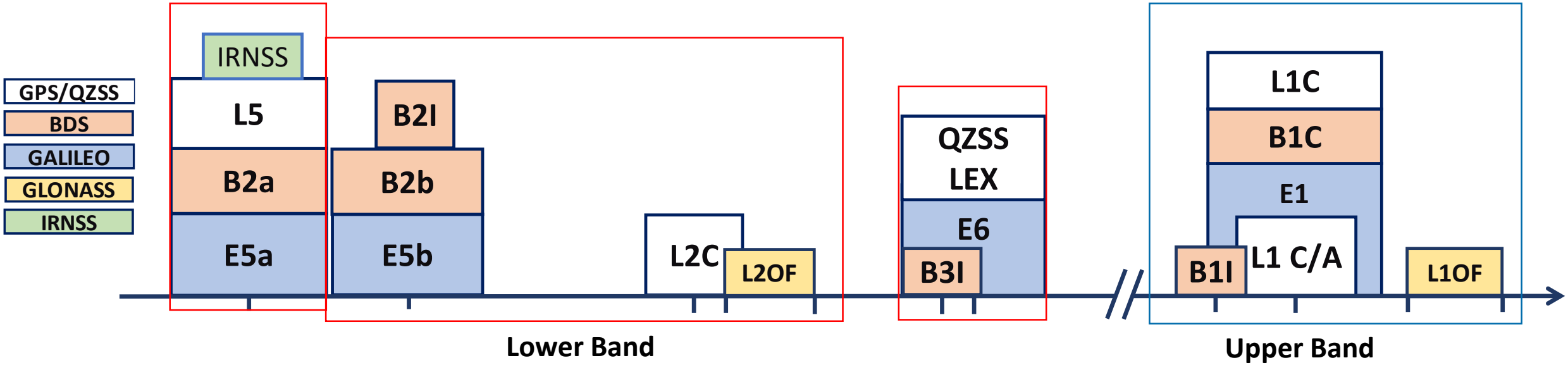


[Option A] L5 band (standalone) : maximizes measurement accuracy and improve multipath mitigation
[Option B] L2 band (RTK) : Common Worldwide CORS supports GPS L1 / L2 & GLO L1 / L2
[Option C] L6 band (PPP) : SSR-type correction service

Multi-Band GNSS SoC Solution

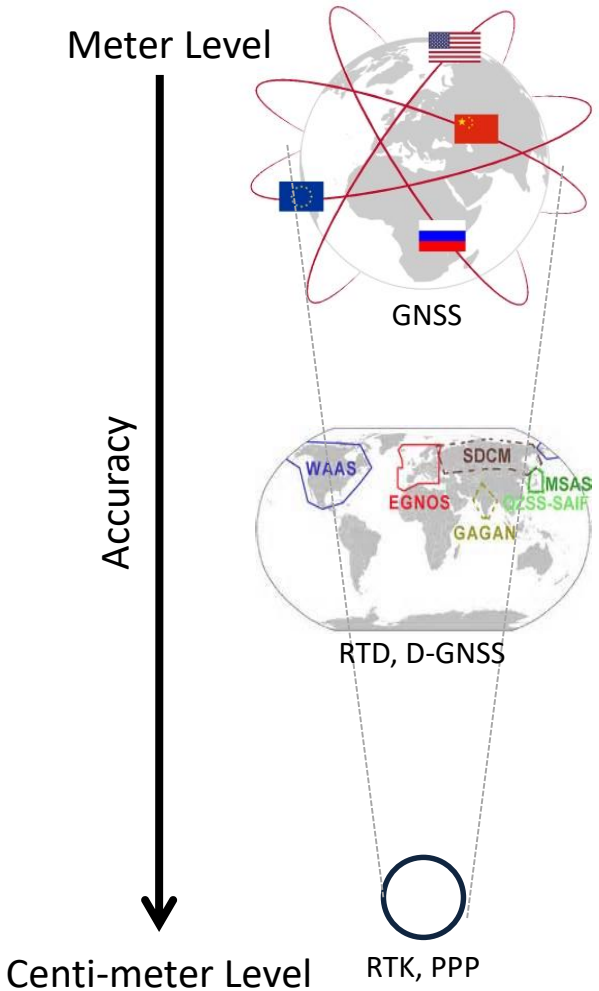
Cynosure GNSS Design Concept : Supported Signals

Dual band GNSS receiver to cover all constellations in all bands for different applications



BAND	L5			L2				L1		
	1176.45MHz	1207.14MHz	1202.025MHz	1227.6MHz	1246MHz	1268.52MHz	1278.75MHz	1561.098MHz	1575.42MHz	1602MHz
GPS	L5C			L2C					L1 C/A, L1C	
BEIDOU	B2a	B2I				B3I		B1I	B1C	
GLONASS			GLO L3OC		L2OF	L2OC			L1OC	L1OF
Galileo	E5a	E5b					E6		E1	
QZSS	L5C			L2C			LEX		L1C/A,L1-SAIF,L1C	
IRNSS	SPS-L5									
WAAS									L1C/A	
EGNOS	L5C								L1C/A	
SDCM									L1C/A	
GAGAN									L1C/A	

ALLYSTAR's One-Stop GNSS Solution



METER LEVEL

Single-Band Multi-System GNSS

Module Reference
Application Design

SUB-METER LEVEL

Single-Band Multi-System GNSS
Multi-Band Multi-System GNSS

ALLYSTAR CORS

Module Reference
Application Design

CENTI-METER LEVEL

Single-Band Multi-System GNSS
Multi-Band Multi-System GNSS

ALLYSTAR CORS
Precise Antenna

Module Reference
Application Design

ALLYSTAR GNSS Product Roadmap

Mass Production

Under Development

Under Planning

2012

Cynosure I

ARM7
128KB RAM + 8KB bakRAM
512KB parallel flash
UART/SPI/I2C/GPIO
3rd party RF

Free-RTOS

2015

Cynosure II - SOC

ARM CM3
128KB RAM + 8KB bakRAM
512KB serial flash
UART/SPI/I2C/GPIO
SQI/PWM/USB
TFT controller

Free-RTOS

2018

Cynosure III - SOC

ARM CM4F
160KB RAM + 32KB bakRAM
384KB embedded flash
UART/SPI/I2C/GPIO
SQI/PWM/USB
CAN/ADC/ADPCM
TFT controller
On chip security

Free-RTOS

2021

Cynosure IV - SOC

Multi-Band

Sensor Fusion

Low Latency

High Update Rate

Improved Reliability

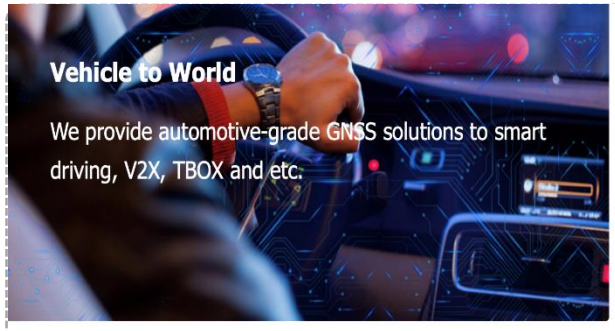
(Connectivity)

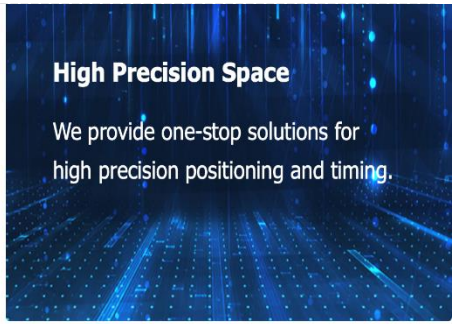
Free-RTOS

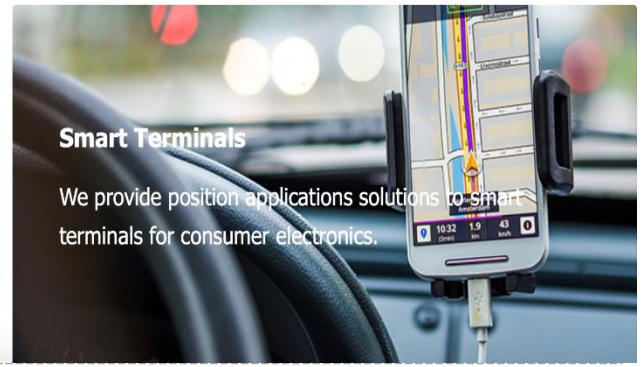
Features	2012	2015	2018	2021
SYSTEM	GPS/QZSS	GPS/BDS/GLN/GAL/QZSS	GPS/BDS/GLN/GAL/QZSS/IRNSS	GPS/BDS/GLN/GAL/QZSS/IRNSS
FREQUENCY	L1	L1	L1/L2/L5/L6	L1/L2/L5/L6
POWER	Moderate	Low	Ultra Low	Ultra Low
SECURITY	-	Software	Hardware	Hardware
RTK/PPP	-	Centimeter	Centimeter	Centimeter
Sensor Fusion	-	O	O	O
A-GNSS	-	O	O	O

ALLYSTAR GNSS Products

- Multi-Band GNSS SoC
- Supports all GNSS systems
- Supports BeiDou-3
- Supports NAVIC
- Supports SBAS
- Supports RTCM
- Low power consumption
- Chip-level RTK solution





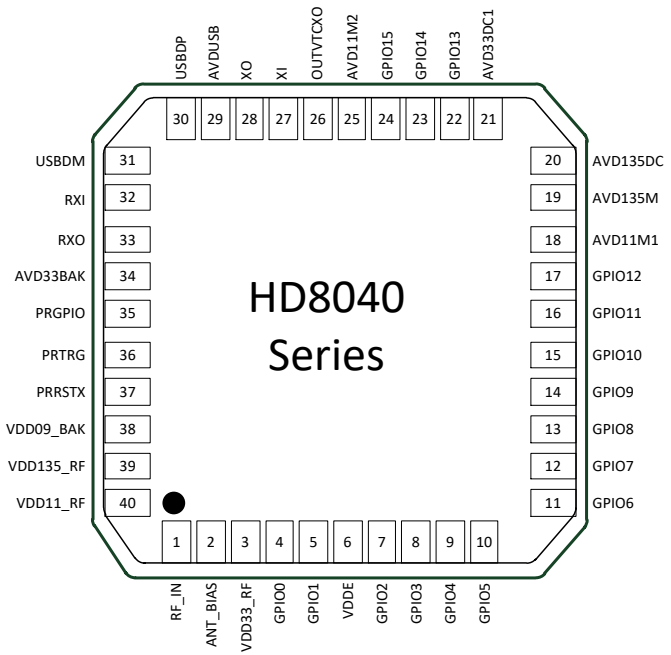


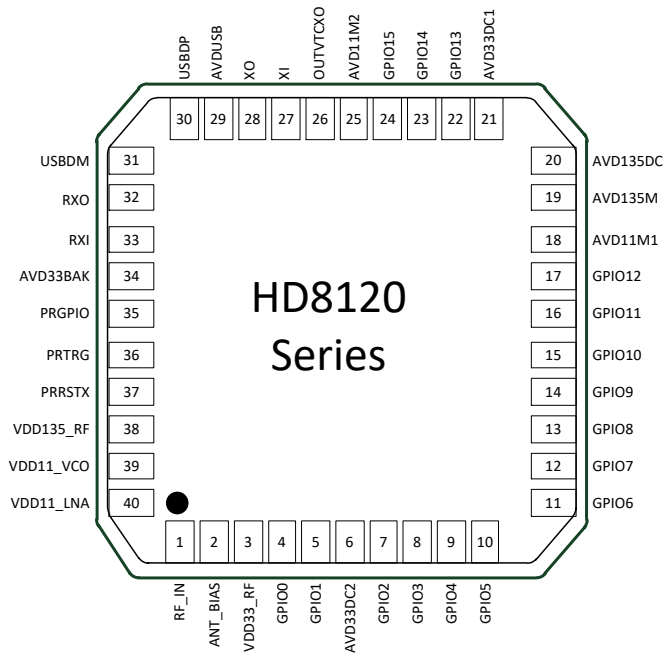
- Flash on chip
- MCU
- Power management
- LNA
- Data encryption SE
- AEC-Q100
- -40℃ -- 85℃ operating temperature
- Operating limit: 515m/s ， 18000m

ALLYSTAR GNSS Features

Cynosure GNSS Product Compatibility

Cynosure III Multi-Band GNSS
GPS/BDS/GLN/GAL
L1 + L2/L5/L6
QFN 5x5 mm2, 40 pin
RF input @ PIN1
Main PWR @ PIN21
Bak PWR @ PIN34
CLK1 @ PIN 27, 28
CLK 2@ PIN 32, 33



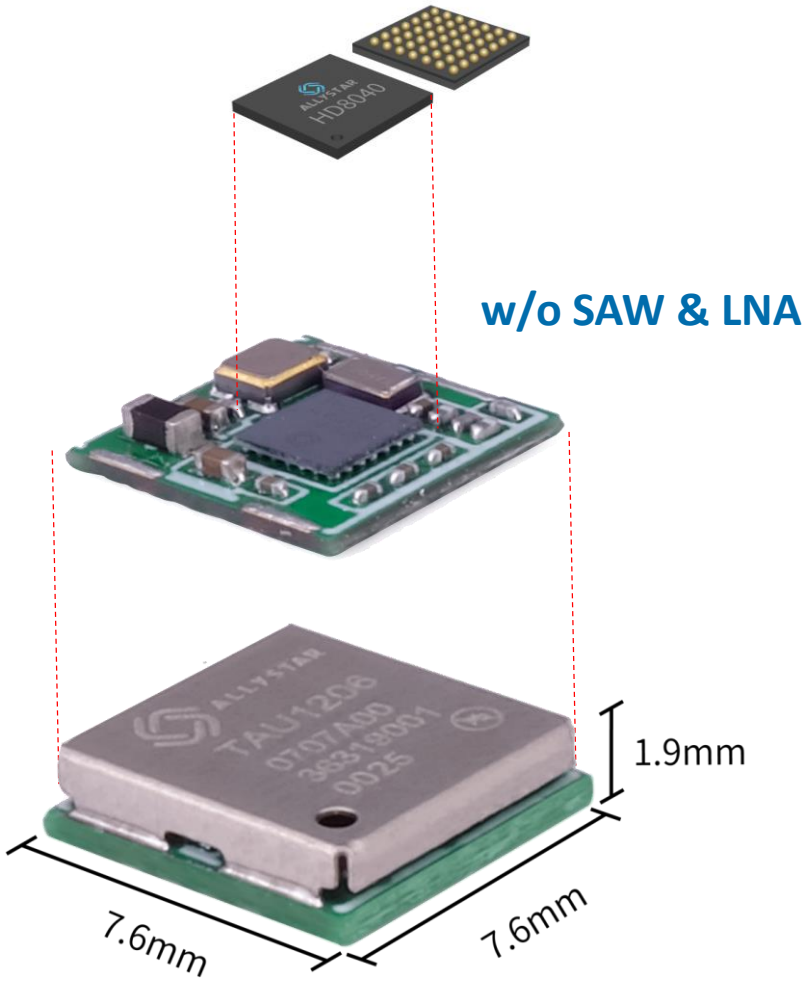


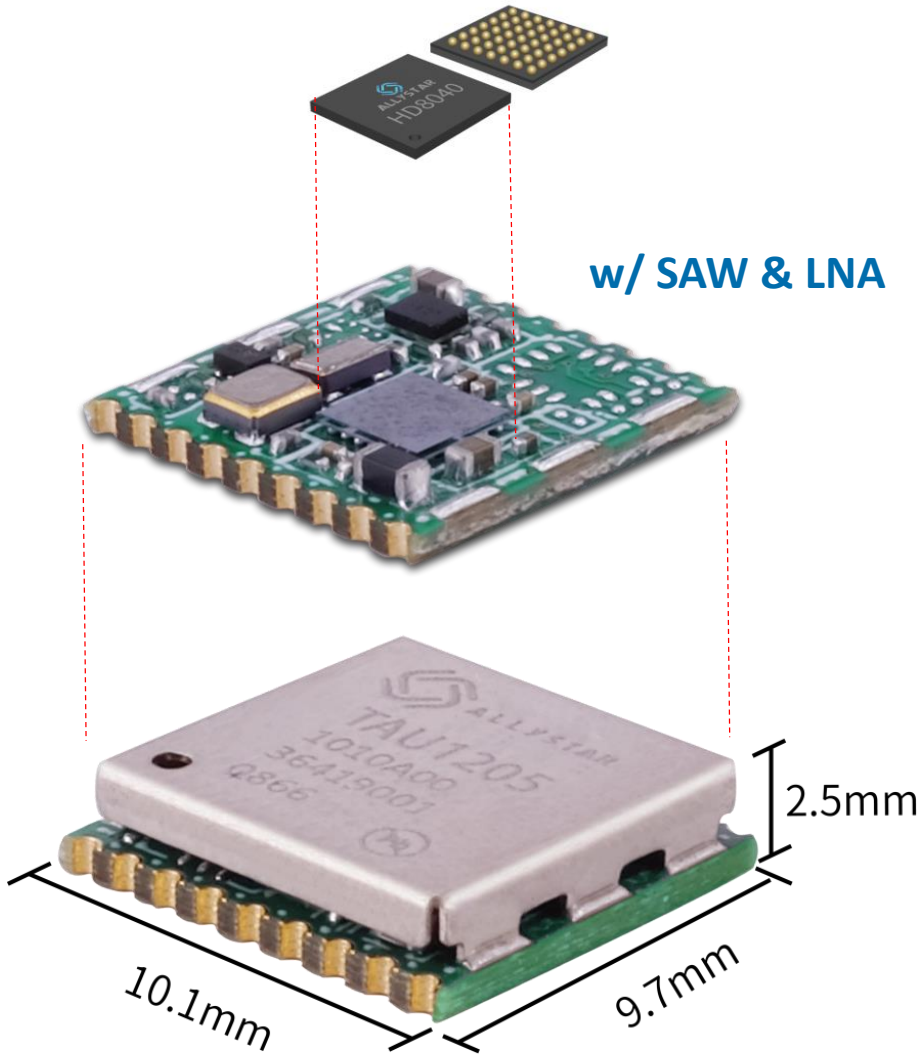
Cynosure III Lite Single Band GNSS
GPS/BDS/GLN/GAL
L1
QFN 5x5 mm2, 40 pin
RF input @ PIN1
Main PWR @ PIN21
Bak PWR @ PIN34
CLK1 @ PIN 27, 28
CLK 2@ PIN 32, 33

- P2P compatible; co-share the H/W board design
- Single RF input; simply the H/W board complexity

ALLYSTAR GNSS Module Solution

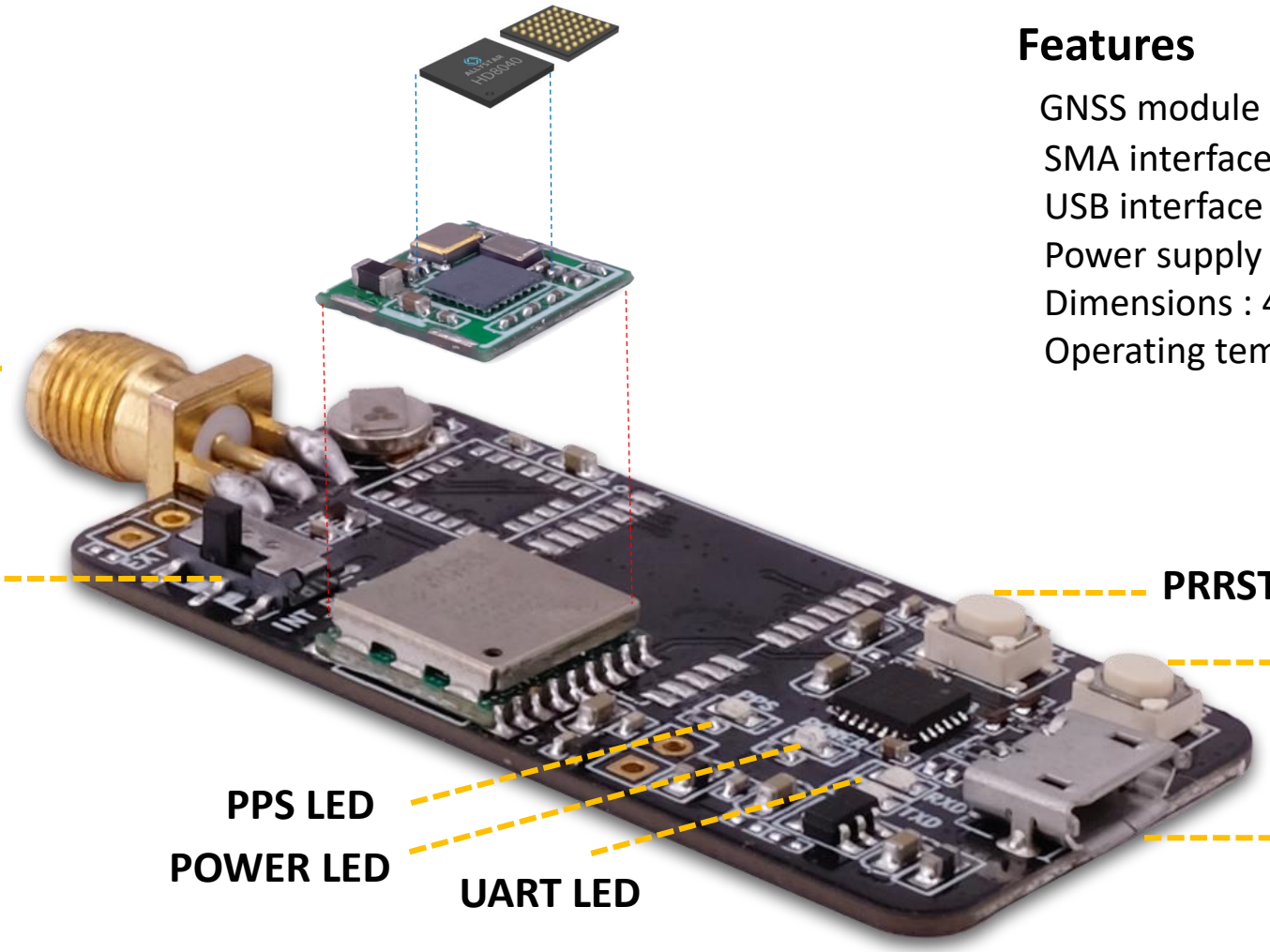
Compact Design with Integrated SAW & LNA





ALLYSTAR GNSS Evaluation Board

Evaluation Board



Features

GNSS module : TAU Series
SMA interface to GNSS antenna
USB interface to PC Software
Power supply : 5V via USB
Dimensions : 48mm x 23mm
Operating temperature : 0°C to +70°C

ALLYSTAR GNSS Module Products

Product	Size				Category				GNSS							Accuracy			Features									Interfaces					Grade		
	7x7mm	10x10mm	12x16mm	16x18mm	Standard Precision	High Precision	Sonsor Fusion	Timing and Frenquency	Multi-band	GPS	BeiDou	GLONASS	Galileo	QZSS	IRNSS	Meter	Sub-Meter	Centi-Meter	Build-in LNA	Data Logging	D-GNSS	Raw Data	RTK Base	RTK Rover	Dead-Reckoning	Timing	Heading	USB	UART	I2C	SPI	CAN	Standard	Professinal	Automotive
Standard Precision GNSS (Meter-Level Accuracy)																																		
TAU1105-1010A00		•			•					•	•	•	•	•		•			•	•									•	•		•		
TAU1111-1216A00			•		•					•	•	•	•	•		•			•	•								•	•	•	•		•		
Enhanced Precision GNSS (Sub-Meter Level Accuracy)																																		
TAU1204-1216A00			•			•			D	•	•		•	•	•		•		•	•	•							•	•	•	•		•		
TAU1205-1010A00		•				•			D	•	•		•	•	•		•		•	•	•								•	•			•		
High Precision GNSS (Centi-Meter Level Accuracy)																																		
TAU1302-1216A00			•			•			D	•	•	•	•	•				•				•	•					•	•	•	•			•	
TAU1303-0707A00	•					•			D	•	•	•	•	•				•				•	•					•	•	•	•			•	
TAU1307-1618A00				•					S	•	•	•	•	•				•				•		•			•	•	•	•	•			•	
TAU1312-1216A00			•			•			D	•	•	•	•	•				•				•	•	•				•	•	•	•			•	

Note : Coming soon (grey color)

GNSS Applications

M2M Module

GNSS
GNSS+2G
GNSS+4G

Wearable Device

Watch
Student Card
Golf-NAVI
M-Bike

Automotive

S-Antenna
T-BOX
UBI
Smart Driving

Logistic

RFID
Tracker
Fleet Mngt.
Goods History

Time & Frequency

Precise Time
Time Keeping
Time Sync.
GNSSDO

Case #1 Smartphone with Dual-Band GNSS

LENOVO Z6 with ALLYSTAR GNSS (L1+L5)

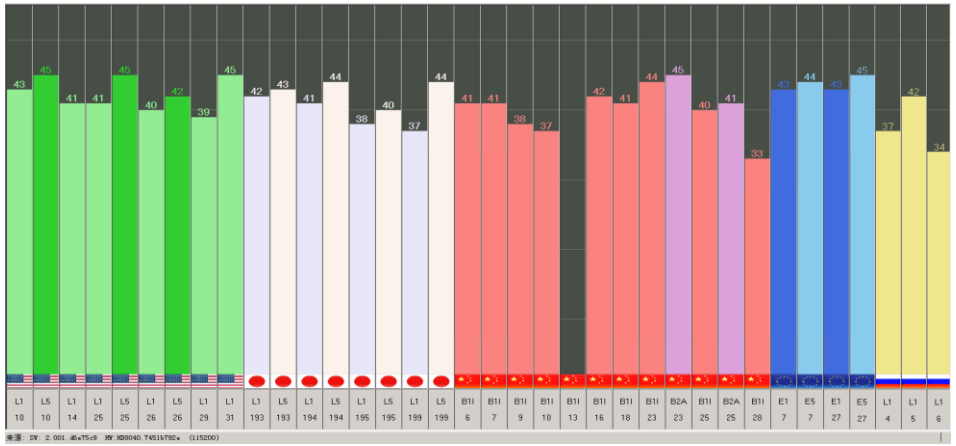
- Leading dual-band L1+L5 GNSS solution
- Latest BDS-3 & NAVIC signals supported
- Google Android Compatibility Test Suite (CTS) : PASS
- Google Android Vendor Test Suite (VTS) : PASS
- Google SUPL2.0 supported
- Allystar propriety A-GNSS server

PRODUCT USER HAND BOOK

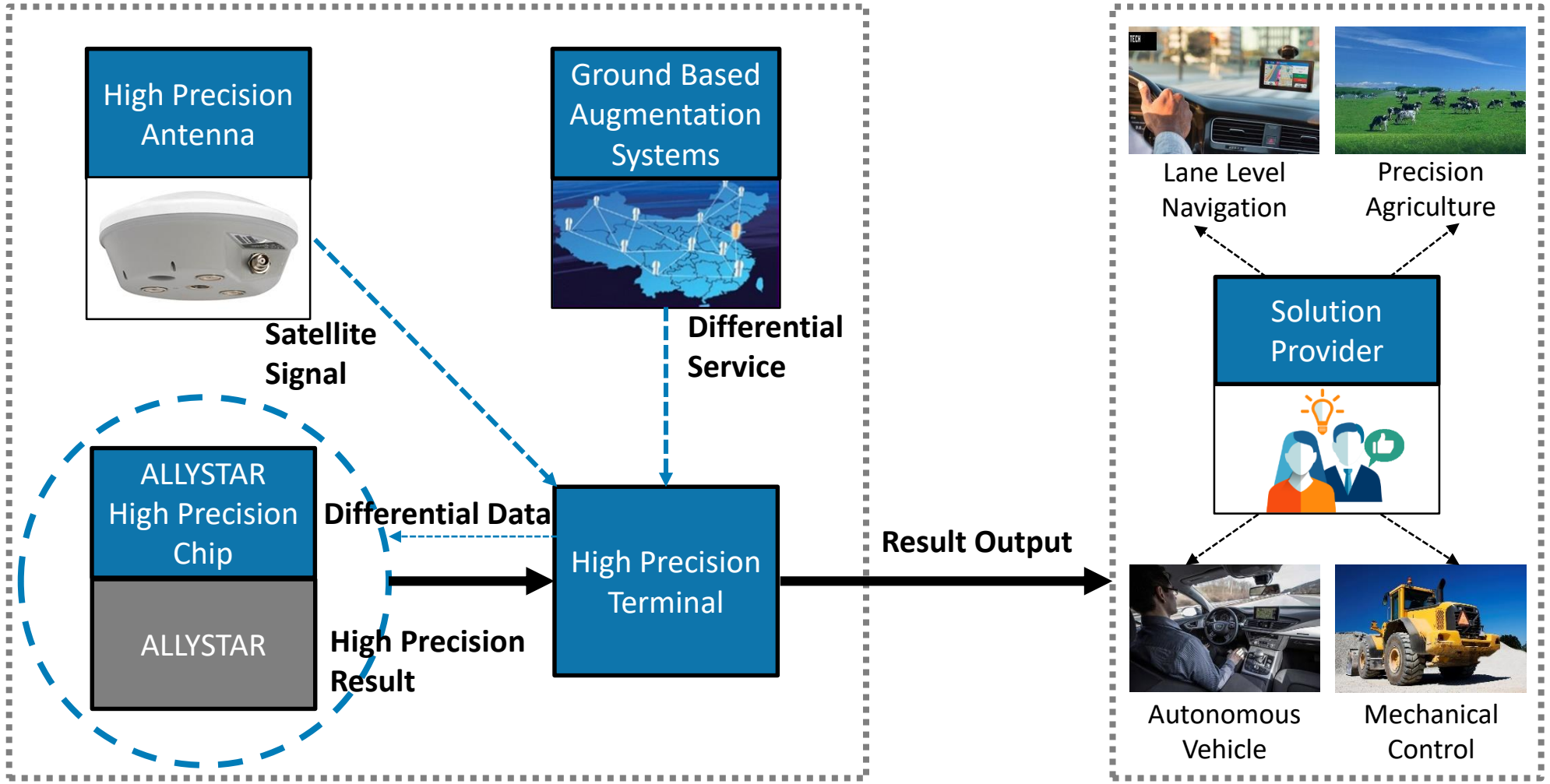
RECEIVER PROTOCOL HAND BOOK

ANDROID DEVELOPMENT PACKAGE INCLUDING DRIVER AND APPLICATION

ALLYSTAR AGNSS USER GUIDE

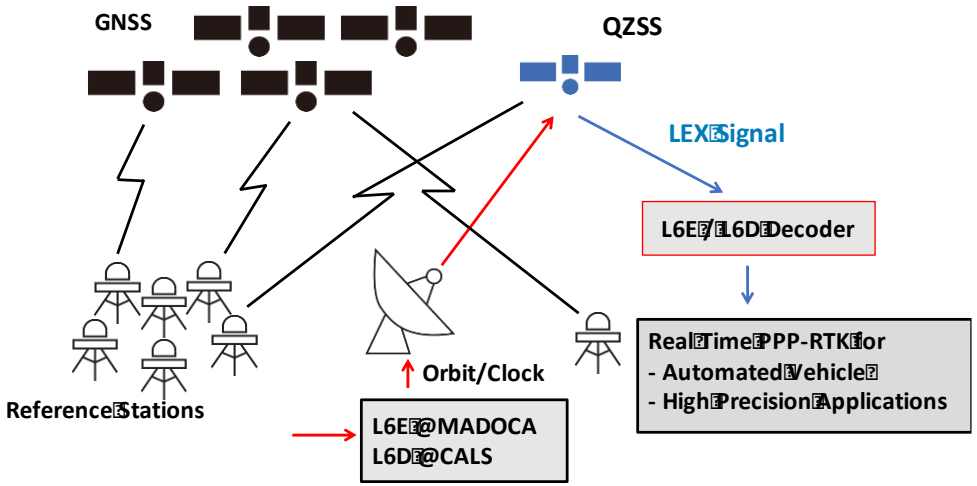


Case #2 Precise Location for Automony

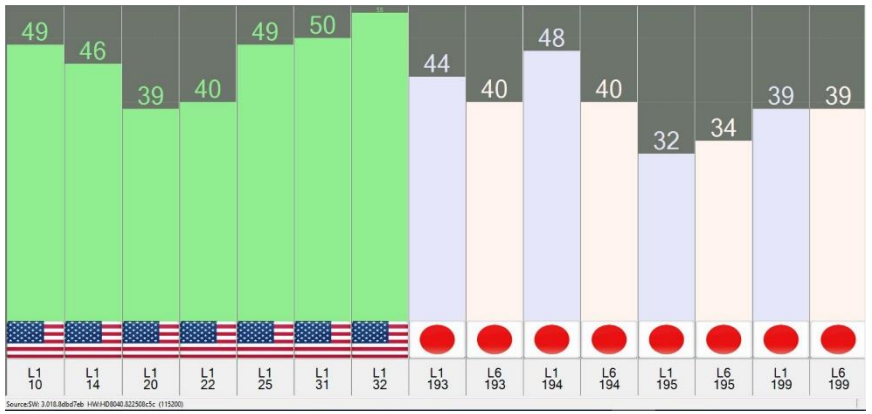


Case #3 QZSS L6D / L6E Decoder

- Satellite-based correction data for PPP application
- Truth: http://sys.qzss.go.jp/dod/en/archives/clas.html
- Data length: 6 hr.
- Location: Allystar Technology (Hong Kong)
- Performance



QZSS L6 CNR (dBHz)	>= 40	35 ~ 39	< 35
Reed Solomon decode rate	100 %	75 %	< 50%



THANK YOU

For more information, visit us at: www.allystar.com

EMAIL : info@allystar.com