

# NEW ENERGY APPLICATION







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# Jiangsu Runic Technology Co.,Ltd

## Jiangsu

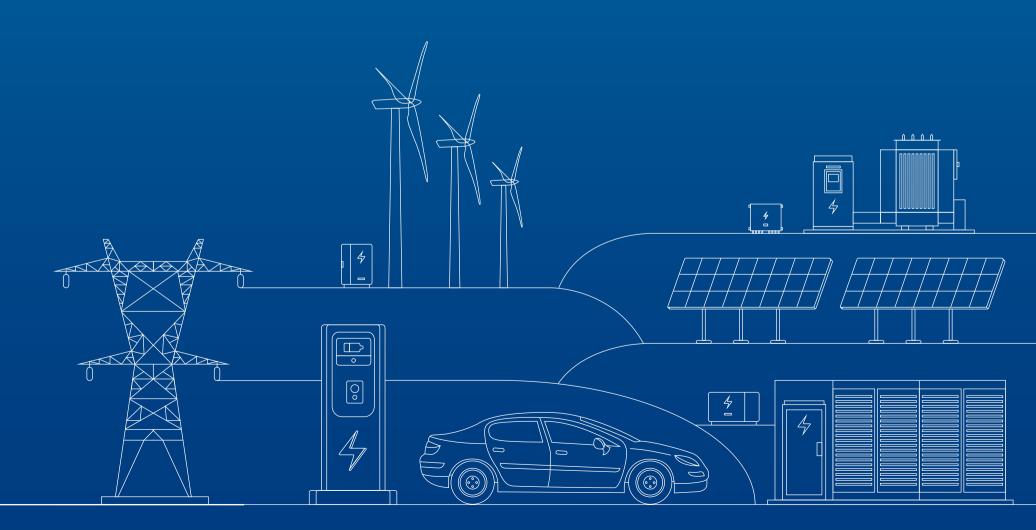
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## | COMPANY | PROFILE



August 2014, Jiangsu Runic Technology Co., Ltd. established



Passed ISO9001: 2015 quality management system



Recognized as Jiangsu high-tech enterprise

Obtained technology-based SME innovation fund

Wuxi New High-Tech District Leading Talent Entrepreneurship

Best Innovation Award



Jiangsu Province AAA Enterprise Credit Ratings
Wuxi Technological Innovation pioneer and Entrepreneurship Competition
Most Potential IC Design Company Award
Best Power IC Product Award



Septermber 2020, Jiangsu Runic Technology Headquarter moved to NO.8-1504 TIANSHANROAD, NEW DISTRICT WUXI

China Analog Semiconductor Leap Achievement Outstanding Business Award
Best China Analog IC Product Award
30 Patent Rights

14 Utility model patent



October 2021 Jiangsu Runic Technology(Shenzhen Branch)moves to Shenzhen IC Industry Park 2021 China IC design Achievements Best Operational Amplifiers/data converters 2021 China Analog Semiconductor Leap Achievement Outstanding Business Award Korean branch established



AEC-Q100 qualified products released 2022 China IC design Achievements Best Operational Amplifiers/data converters/Isolator of the year Taiwan branch established



Runic Technology is a fast-growing, innovative semiconductor design and manufacture company that focus on general purpose and high-performance analog and mixed-signal ICs.

Our product portfolio includes op-amps, comparators, analog switches, data converters, level shifters, little logic ICs, voltage references, LDOs, DC/DCs, load switches, reset ICs. These products are widely used in various industries, such as consumer electronics, computing, communications, industrial, and automotive markets.

Runic Technology's headquarter is located in Wuxi, China. We have global sales offices in South Korea and Taiwan and distribution partners in Europe and Americas.

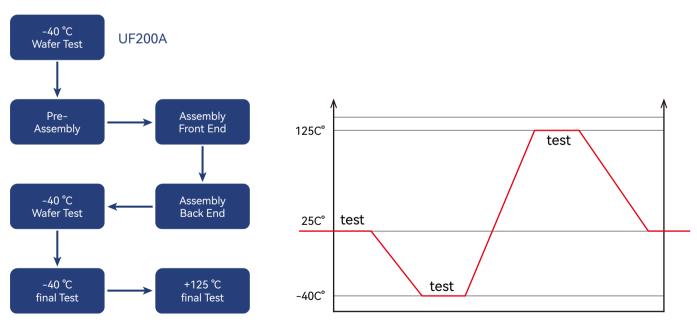
Our Goal is to become a world-class analog IC supplier and bring our IC to serve worldwide customers.





Highest standard TSK tri-temperature prober and industry leading Cohu tester are used to implement Runic's tri-temperature test.

# TRI-TEMPERATURE TESTING PROCESS



Rasco-1000/2000 or Equivalent

Runic implements low temperature test to screen wafer level early defects and room/high temperature tests for finished goods.

All automotive grade products at Runic will go through full tri-temperature test flow.

# AEC-Q100 GRADE1 QUALIFIED ANALOG IC

「Operational Amplifier」「Analog Switch」

「Little Logic Series」

「Voltage Reference」

<sup>「</sup>Comparator」

「Linear Regulator」

「Level Converter」

「Power Products」



# AUTOMOTIVE ELECTRONICS QUALITY SYSTEM

Runic Technology is continuously pursuing higher quality management systems. We have established DQE, SQE, CQE, QS to improve quality management on design, manufacture and test, which will result in higher product quality.

High quality of automotive electronics

(zero defect, PPM zero ppm, zero quality spill,.etc

human

machine

material

method

environment

Quality awareness and method of automobile electronics

(zero defect, continuous process improvement, error-proofing

Automotive electronics quality requirement standard

Automotive electronics quality system

(IATF16949, VDA6.3, AEC-Q100)

Quality objective:

Meet highest automotive electronics quality standard.

The assembly factories apply 4M1E.

Implements quality audit to suppliers every 6 months.

Runic implements APQP standard process on automobile products same as international tier 1 automobile product original manufacturer.

Advance correct action plans to package contractors.

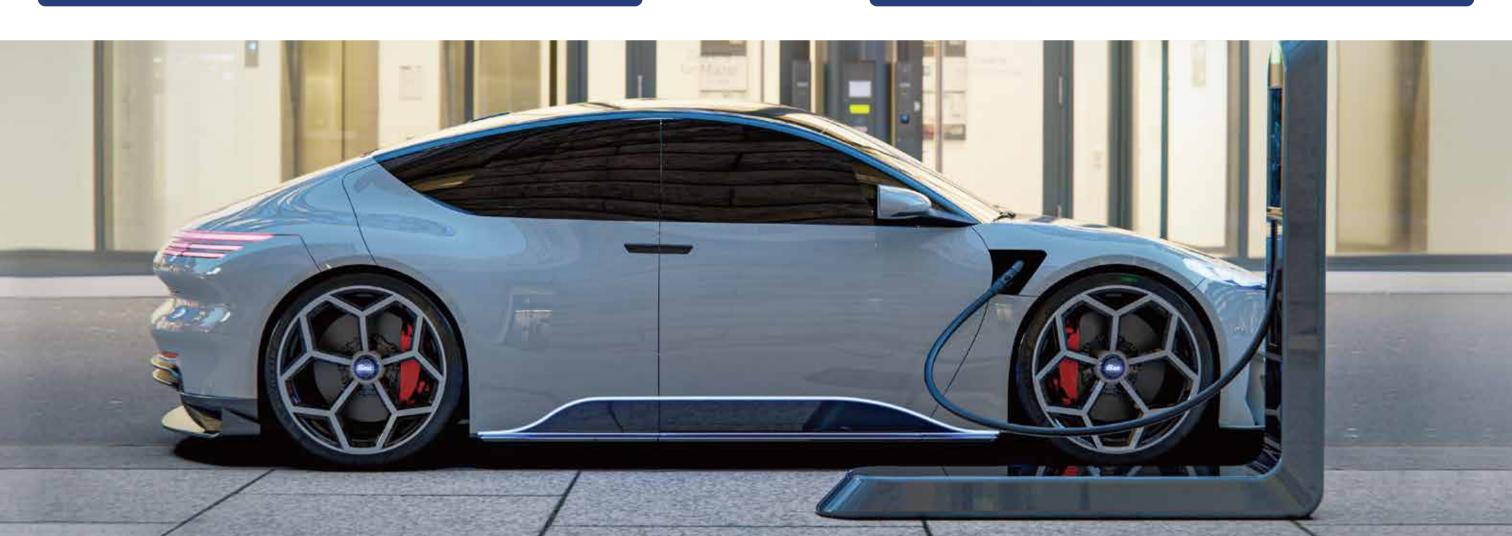
Define SOP and set up test standard for tri-temperature testing.

Set up control plans and test surveillance plan for automotive grade products.

Choose wafer foundries with TS16946 certification and automotive qualification standards.

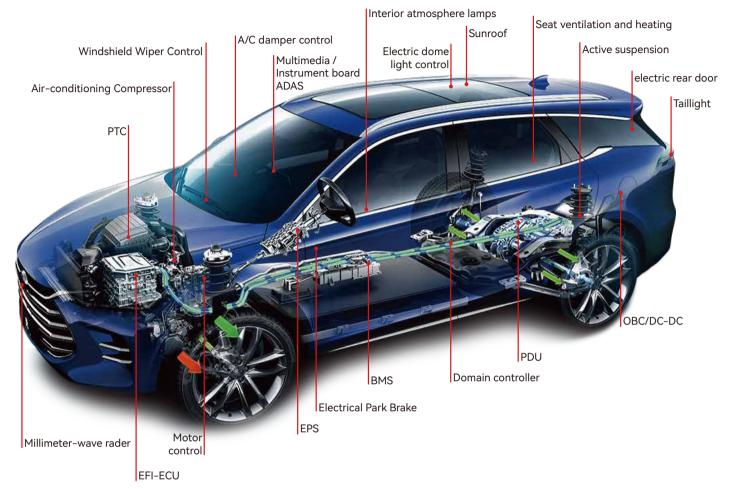
Implement and received ISO26262 functional safety standard certification.

The Runic Technology automotive grade products pass AEC-Q100 Grade 1 + MSL1 qualification.



#### **Applications of Runic Products in Automotive Electronics**

Jiangsu Runic Technology provides a series of high precision and high reliability products in power system, in-vehicle infotainment, instrument panel body control electronics car sensors etc fields.



#### **Cabin Parts**

Infotainment, Instrument cluster, Head unit & Amplifier, Digital Cockpit, T-BOX(V2X)



#### Intelligent cockpit

- ► High-precision LDO RS3236
- ► High Voltage LDO RS73xx-1 / RS3007
- Level Converter
  RS010X / RS2T45 / RS4T245
- Analog Switch RS2227 / RS2228
- Load Switch
  RS2588
- Low Noise Op-amp RS62X

#### **GPS Tracker**

- Low-power comparators RS8901
- ► High Voltage LDO RS3221/RS3236
- ► High-precision Op-amp RS8511

#### Mobile wireless charging

- ► High Voltage LDO RS73xx-1
- ► General-purpose Op-amp LM358

#### Driving recorder

- High precision LDO
- ► High Voltage LDO RS73xx-1 / RS3007
- Level Converter
  RS010X / RS2T45 / RS4T245
- Analog Switch RS2227 / RS2228
- ► Load Switch
- RS2588
- Low Noise Op-amp RS62X

**BCM** 

► General-purpose Op-amp

► High Voltage general Op-amp

► High-speed Comparator

► High Voltage Comparator

► Shunt Voltage Reference

RS321 / RS324 / RS358A RS6331 / RS6334 / LM358

RS841X / RS842X

LM2901 / LM2903

► Low Noise Op-amp

## **Car Body Parts**

BCM、Door & Window、Lighting、Seats、Steering wheel、Heating & cooling、Mirrors



#### HVAC Compressor

- ► Low Offset Voltage Op-amp RS721P / RS722P / RS724P
- General-purpose Op-amp LM358
- ► High-precision Op-amp RS8551
- ▶ High Voltage general Op-amp RS8411P / RS8412▶ High-speed Comparator
- RS393 ► High Voltage Comparator
- LM2901 / LM2903

  ▶ Shunt Voltage Reference
- RS431 / RS432
- ➤ Small Logic RS4G125 / RS1G126

#### Door module

Low Noise Op-amp RS721 / RS722

I M2903

- General-purpose Op-amp RS358A / LM358
- ► High Voltage general Op-amp RS8412 / RS8422
- ▶ High-speed Comparator RS331▶ High Voltage Comparator
  - Analog Switcg

RS331

RS722

- Level Converter
- RS2T45 / RS0204 / RS0108
- ► Small Logic RS1G17 / RS1G125 / RS4G125 RS1G126 / RS1G07

#### **Power Parts**

VCU、OBC&DC-DC、BMS、Inverter & motor control、Gear Box、EPS



#### VCU

- ► Low offset Op-amp RS721P / RS722P / RS724P
- ► General-purpose Op-amp RS321 / RS358 / RS324
- ► High Voltage general Op-amp RS8412 / RS8414 RS8422 / RS8424
- ► Shunt Voltage Reference RS431 / RS432
- ► Level Converter RS2T45 / RS0104 / RS0204 RS0108 / RS8T245

#### Motor Cotrol

- ► Low offset Op-amp RS721P / RS722P / RS724P
- ► General-purpose Op-amp RS321 / RS358 / RS324 LM358
- ► High Voltage general Op-amp RS8411 / RS8412 / RS8414
- ► High Voltage Comparator LM393 / LM331 / LM2903 LM2901
- ➤ Shunt Voltage Reference RS431 / RS432 ➤ Level Converter
- RS2T45 / RS8T245

  Small Logic
  RS4G00 / RS1G08 / RS2G08
  RS4G08 / RS1G17 / RS1G125

#### Gear box

- ► Low offset Op-amp RS721P / RS722P / RS724P
- ► General-purpose Op-amp RS321 / RS358 / RS324 LM358
- ► High Voltage general Op-amp RS8411 / RS8412 / RS8414
- ► High-precision Op-amp RS8551
- ► High Voltage ComparatorLM331 / LM2903► Shunt Voltage Reference

RS431 / RS432

► Small Logic RS4G00 / RS1G08 / RS2G08 RS4G08 / RS1G17 / RS1G125

# BMS

- ► Low offset Op-amp
  RS721P / RS722P / RS724P

  ► General-purpose Op-amp
- RS321P / RS358 / LM358

  High Voltage general Op-amp
- RS8411 / RS8412 / RS8414

  High-precision Op-amp
- RS855X

  High-speed Comparator
- RS331 / RS393

  High Voltage Comparator
- LM331 / LM2901 / LM2903

  ▶ Shunt Voltage Reference
  RS431 / RS432
- ► Level Converter RS2T45 / RS0204 / RS0108
- ➤ Small Logic
  RS4G00 / RS1G08 / RS2G08
  RS4G08 / RS1G17 / RS1G125

#### OBC

- Low offset Op-amp RS721P / RS722P / RS724P RS821P
- ► General-purpose Op-amp RS321 / RS358 / LM358
- ► High Voltage general Op-amp RS8411 / RS8412 / RS8414 ► High-precision Op-amp
- RS855X ▶ High-speed Comparator
- RS331 / RS393

  High Voltage Comparator
- LM331 / LM2901 / LM2903
  Shunt Voltage Reference
  RS431 / RS432
- ► Analog Switcg
  RS2251 / RS2166 / RS2057

#### DC/DC converter

- ► Low offset Op-amp RS721P / RS722P / RS724P RS6331P ► General-purpose Op-amp
- RS321 / RS358 / LM358

  High Voltage general Op-amp
- RS8411 / RS8412 / RS8414

  High-speed Op-amp
- RS8751 / RS8752

  High-speed Comparator
  RS331 / RS393
- ► High Voltage Comparator LM393 / LM2903
- ► Shunt Voltage Reference RS431 / RS432

#### EPS

► Low offset Op-amp RS721P / RS722P / RS724P

► General-purpose Op-amp

- RS321 / RS358 / LM358

  High Voltage general Op-amp
- RS8411 / RS8412 / RS8414

  High-precision Op-amp
- ► High-speed Comparator
- ► High Voltage Comparator LM331 / LM2901 / LM2903
- Analog Switcg
  RS2057

RS331 / RS393

➤ Small Logic
RS1G08 / RS2G08 / RS1G125

#### VESS

- ► Low offset Op-amp
  RS721P / RS722P / RS724P

  ► General-purpose Op-amp
- RS321 / RS358 / LM358

  High Voltage general Op-amp
- RS8411 / RS8412 / RS8414

  High-speed Comparator
  RS331
- ► High Voltage Comparator LM331 / LM2903
- ► Level Converter RS2T45 / RS0102 / RS0202

#### Application of Runic Products in Energy Storage

In 2020 China commits, to reach carbon dioxide emission peak before 2030 and achieve carbon neutrality before 2060. Wind and solar power therefore become the main sources of China's energy system.

Runic Technology's low-offset voltage operational amplifiers, high-voltage general-purpose operational amplifiers, high-voltage comparators, level conversion, analog switches, voltage reference sources, small logic, reset and other product families are used in the field of new energy photovoltaics, energy storage, and outdoor power supplies.



► High Voltage General-purpose Op-amp

RS845x / RS841x / RS845xP RS841xP

#### Sequential & Shaping Circui

► Small Logic RS1G14 / RS6G14 / RS1G08 RS4G08 / RS6G07 / RS244/5

#### Voltage Reference

► Shunt Voltage Reference RS431 / RS432

► High Voltage Comparator ► Level Converter LM2903 / LM2901

RS010x / RS020x / RSxT245

#### DSP/FPGA Voltage Monitoring

► Voltage Detection and Reset RS706 / RS809

Runic Technology's low-offset voltage operational amplifiers, high-voltage general-purpose operational amplifiers, high-voltage comparators, level conversion, analog switches, voltage reference sources, small logic, reset ICs are used in the field of rectifier of the wind power system .



► High Voltage Generalpurpose Op-amp RS845x / RS842x

### Sequential & Shaping Circuit

► Shunt Voltage Reference RS431 / RS432

▶ Level Converter RS010x / RS020x / RSxT245 RSxT45

► High Voltage Comparator LM2903 / LM2901

### DSP/FPGA Voltage Monitoring

► Voltage Detection and Reset RS706 / RS809

#### Sequential & Shaping Circuit

► Small Logic RS1G14 / RS6G14 / RS1G08 RS4G08 / RS6G07 / RS244/5 Energy storage has been viewed as a key component of the new energy revolution. Runic Technology's precision operational amplifier, high voltage genral-purpose operational amplifier, high voltage comparators, level converter, voltage reference, LDO etc IC are widely used in concentrated energy storage and portable power.

Concentrated solar power (CSP) is particularly suitable for high power and long-term power supply scenarios to dispatch electricity generation, which requires high ability to adjust, control and plan in the operation management centralized scheduling of electric power system.

Portable power gets rid of "wire" restrictions, Electrical devices can be powered by lightweight, portable high capacity high power standby power stations, which are commonly used in outdoor travelling emergency rescue and medical equipment power suppliers.

#### Energy Storage

► LDO

RSxT45

RS7533 / RS7550

► Voltage Reference RS431 / RS432

► Level Converter

RS010x / RS020x / RSxT245

- ▶ High precision generalpurpose Op-amp RS8539 / RS8557
- ► High Voltage Comparator LM2901 / LM2903 / LM393 ► Low-offset Op-amp
- RS72xP Low Noise Op-amp







"New Infrastructure" spurs new-energy vehicle charging stations. This makes charging stations more accessible for electric vehicles. Meanwhile electric vehicles will promotoe EV charging station's revolution. Analog ICs are widely used in AC/DC charging point's high voltage leakage detection, CP/CC detection, voltage/current/temperature sample test, liquid-cooled charging gun and its temperature test.



#### Charging Station

- ▶ low Noise Op-amp RS72x
- ► High Voltage Generalpurpose Op-amp RS842x / RS845xP / RS841x
- ► High Voltage Precision Operation Op-amp RS865x
- ► High Voltage Comparator LM2903 / LM2901
- ► Level Converter RS010x / RS020x / RSxT245 RSxT45
- Analog Switch RS2251 / RS2252 / RS2257 RS2102
- ▶ Voltage Reference RS431 / RS432
- ► Logic IC RS1G14 / RS6G14 / RS6G07 RS4G08 / RS245
- Reset RS809 / RS706

#### AC-DC

► General-purpose Op-amp LM358 / RS358 / RS633x ► High Voltage Comparator

LM2903 / LM2901

purpose Op-amp

RS84xx / RS845x ► Low-offset Voltage Op-amp RS62xP / RS633xP

► High Voltage General-

► Low Noise Operational Amplifier RS62x

► Logic IC RS2G17 / RS2G14 / RS1G00 RS244 / RS245

► Analog Switch RS2251