



Driven by today's technological wave, driverless technology is being integrated into our daily lives at an unprecedented speed, and the rise of driverless travel services such as "Apollo Go" has become a distinctive footnote of this change. This trend not only accelerates the intelligent transformation of the automotive industry, but also profoundly affects the design and evolution of electrical systems for new energy vehicles. With the popularization of high-voltage electrical architecture and the advancement of low-voltage systems to higher voltage levels, new energy vehicles are gradually building a solid foundation to support the robust operation of driverless technology.



New energy vehicles currently mainly use lithium batteries, and endurance and charging speed are key factors restricting their development. The transmission capacity of the power supply system follows the basic circuit principle, that is, $P=UI$. To obtain greater power, it is necessary to increase the voltage level of the system, or use a thicker wiring harness to transmit a larger current. However, the increase in current will inevitably lead to an increase in the amount of conductors and heat loss. Under the limitations of device cost, volume and weight, it is a more economical solution to increase the power supply voltage level in the automotive electrical system. The electrical system of new energy vehicles is divided into high voltage and low voltage. The high voltage part includes batteries, motors, electronic controls and high voltage wiring harnesses. In order to meet the needs of fast charging, mainstream manufacturers currently widely configure and focus on promoting their 800V high voltage architecture design on new products. In contrast, low-voltage automotive electronic systems, including automotive control systems, power systems, sensor systems, multimedia systems, lighting systems, safety systems, etc., are mainly developing in the direction of intelligence, and auxiliary batteries are still at the level of 12V.

The 12V electrical architecture of automobiles has a history of more than 70 years, and the system solution is very mature, but the current carrying capacity of the system has almost reached its limit, and it is difficult to support the increasing demand for intelligence and entertainment. 48V means 4 times the capacity of the 12V system, with smaller and lighter wiring and components, higher integration, which can meet higher power demand and reduce the manufacturing and use costs of electric vehicles. At the same time, it does not exceed the 60V safety voltage, which is a choice with both performance and safety. However, the market was not active in improving the low-voltage voltage level before. Currently, the 48V architecture is mainly used by some mild hybrid vehicles, including Mercedes-Benz, BMW, Audi, Toyota, Hongqi, etc., and the parts suppliers include Bosch, Continental, Valeo, Schaeffler, etc. In actual structure, 48V and 12V coexist, and the circuit is relatively complex. Changing the voltage of the automobile system requires not only a higher-performance battery, but also an upgrade of all low-voltage series equipment including audio, wipers, lights, wiring harness switches, and motors to 48V.

ITECH provides professional and efficient electrical test solutions for automotive electronic products. Automotive electronics production lines face a wide range of products, has always been the pursuit of high-efficiency, highly integrated test solutions, IT2700 multi-channel modular power system with ultra-high power density, 30V/60V/150V wide range of outputs to cover a variety of automotive electronics low-voltage system testing needs. The 1U main frame can include up to 8 modules (200W each) or 4 modules (500W each). Different modules can be grouped and synchronized. The modules could be bidirectional DC power supplies, DC power supplies or regenerative loads. And they can be connected with each other in parallel. They have built-in LAN, USB, CAN, digital I/O and free PC software. It can be widely used in ATE integration in R&D, design verification and manufacturing of DC-DC converter, communication power semiconductors, 3C products, like smartphone, PCBA, battery simulation and test, chips BMS chips etc.

In terms of anti-interference testing of automotive power supply, IT6000C and IT-M3900C bidirectional DC power supplies have built-in LV123, LV148, DIN40839, ISO-16750-2, SAEJ1113-11, LV124, ISO21780 and ISO21848 standard automotive power network voltage curves. ITECH new product IT6600C high power bidirectional power supply has added built-in ISO21498-2, which includes 9 regulatory testing functions.

ISO 21780:2020 "Road Vehicles - 48V Supply Voltage - Electrical Requirements and Tests" published by ISO specifies the requirements and tests for electrical and electronic components installed in road vehicles with a nominal voltage of 48V DC electrical systems, including general requirements, voltage ranges, and slow voltage transients and fluctuations of 48V DC electrical systems. IT6600C high power bidirectional DC power supply provides a touch screen graphical display, making operation more convenient.

LV148 "Electrical and Electronic Components in Automobiles - Requirements and Experimental Conditions for 48V Onboard Electrical Systems" was jointly released by several major German automakers and is widely used in the market. The IT-M3900C series 32V-1500V has built-in automotive electronic waveform functions, meeting both high-voltage and low-voltage system test requirements, covering the 2kW-12kW power range and having high power density characteristics.

The evolution of new energy vehicle electrical systems will continue to lead the intelligent and green transformation of the automotive industry. As driverless technology continues to mature and become more popular, the requirements for high performance, high reliability and high safety of electrical systems will become increasingly stringent. ITECH will continue to be committed to technological innovation and product upgrades to provide more advanced and reliable testing solutions for the automotive industry.



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