ITECH
YOUR POWER TESTING SOLUTION

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ITECH TEST SOLUTION

Electric Vehicle

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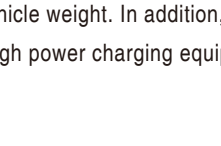
The rise of the electric vehicle industry has brought a technological revolution in the automotive industry. With the new wave of electrification and intelligence, the electrical architecture of vehicles is moving from the traditional 300V/400Vdc to 800V/1000Vdc. High-voltage technology can significantly increase charging speed (from 14km/min to 34km/min for DC fast charging) and reduce vehicle weight. In addition, the development of electrified structures is driving technological innovations in high energy density batteries, high power charging equipment and drive systems.

In the future, with the fast development of V2G/V2V/V2H technologies, EV as a mobile energy storage device will play an important role in home energy management systems, micro-grids and smart grids. The AC-DC, DC-DC and DC-AC power conversion modules of EV are moving to bidirectional energy flow technologies. Engineers are challenged to build efficient test platforms for today's and tomorrow's test requirements.

ITECH provides test equipment and automated test solutions for testing AC and DC charging station, charging interfaces, powertrains, batteries and various automotive electronics devices of EV. Our solutions include battery test systems, charging equipment test and simulation system, battery simulators, grid simulators, bidirectional DC power supplies, regenerative AC/DC loads and related software., which largely saves your time and cost on research and test job.

New trend of EV technologies

- Integration of EV components
- High voltage design
- High power fast charging
- Bidirectional energy flow



800 Volt system voltage

- Faster charging
- Higher continous power
- Less weight
- Less volume

ITECH EV Test Solution

Charging station

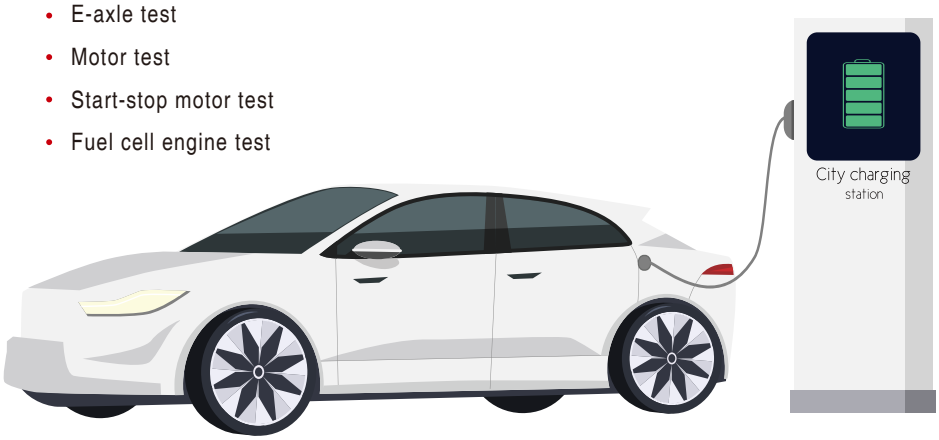
- Test and simulation for AC/DC Charging piles
- Portable charging equipment test
- OBC/BOBC test
- DC-DC converter test
- Charging gun test
- Wireless charging device test

Powertrain

- Motor drive test
- E-axle test
- Motor test
- Start-stop motor test
- Fuel cell engine test

EV batteries

- Cell/battery module/ battery system test
- Fuel cell stack test

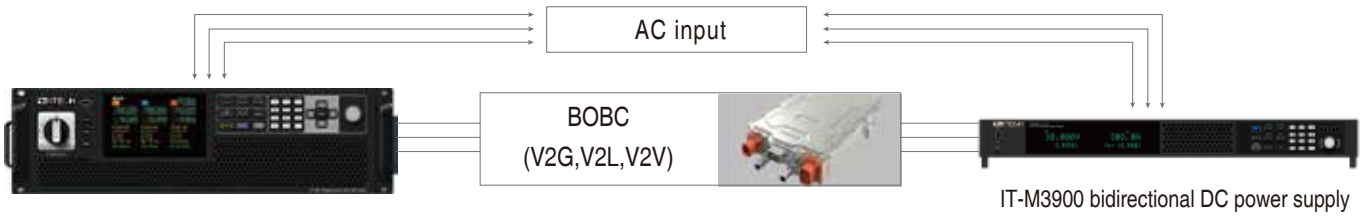


Recommended Models

No.	DUT	Model	Advantages
1	Cell/module/battery system	ITS5300 battery charge and discharge test system	drive condition simulation, BMS communication, sampling rate up to 1ms,statistical analysis
2	Bidirectional DC charging modules	IT6000C bidirectional DC power supply IT7900P grid simulator	High power density 2 in 1 unit - bidirectional power supply and regenerative load Max. 95% regenerative efficiency Current seamless switching Waveform programming Built-in power meter
3	BOBC/DC-DC	IT6000C bidirectional DC power supply IT-M3900C bidirectional DC power supply IT7900P grid simulator IT8200 regenerative AC electronic load	
4	PV charging station	IT6000C+SAS1000 PV simulator	built-in regulation standard 100 curves Table, Program, LIST function Parameter editing online Fast dynamic response
5	Radio receivers	IT6000C+BSS2000 battery simulator	Built-in battery simulator mode CC/CV/CR/CP
6	Fuel cell system	IT8400 high performance electronic load IT8000 regenerative DC electronic load IT6000D high power programmable DC power supply IT-M3900D high performance DC power supply	High power density Max.95% power regeneration Fuel cell test - low voltage, high current
7	Motor drive/Motor/E-axle	IT6000C bidirectional DC power supply	Built-in battery simulator mode Automatic absorption of back EMF Built-in CAN/USB/LAN/digital IO and remote inhibit

EV Test Solution - charging equipment

01 BOBC&DC-DC test(V2G,V2L,V2H...)



IT7900 regenerative grid simulator

IT-M3900 bidirectional DC power supply

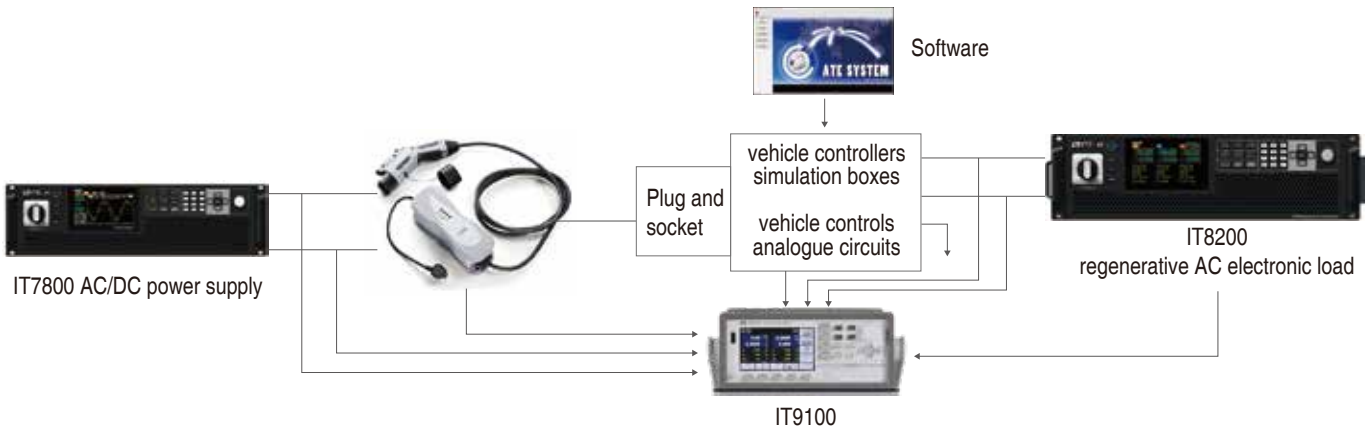
IT7900 highlighted features

- 15kVA in 3U single unit, power extended to 960kVA
- Regenerative AC load, simulating inductive/capacitive/resistive loads
- Simulate grid interference, up to 50th order
- Big screen, displaying waveform/trend/THD

IT-M3900 bidirectional DC power supply

- Ultra-compacted design, 6kW in 1U, max.16 units can be connected in parallel
- Integrate power supply and electronic load, current seamless switching, up to 95% regenerative efficiency
- Source mode: CC/CV/CP, Sink mode: CC/CV/CR/CP
- fast dynamic response: less than 2ms

02 Wall-mounted AC charging unit/portable charging unit test



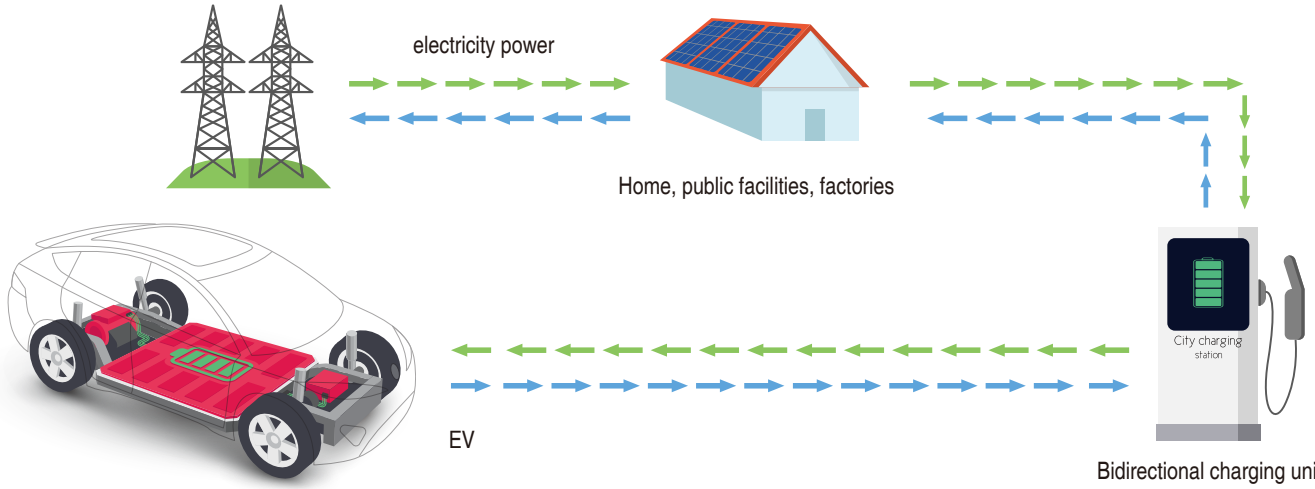
Highlighted features

- High power density, 15kVA in 3U
- Optical fiber connection in parallel, no loss after power extension
- Programmable AC power supply with functions including THD/LIST/Pulse/ user-defined waveform
- Touch screen, built-in oscilloscope and waveform trending function
- Regenerative AC load with max.95% feedback efficiency and functions including rectification/CC/CR/CP and adjustable PF
- Optional analog interface, power amplifier
- Built-in CAN/LAN/USB, supporting CANOpen/SCPI

03 Bidirectional DC charging pile test

IT7900P regenerative grid simulator

IT6000C bidirectional DC power supply
(battery simulation)



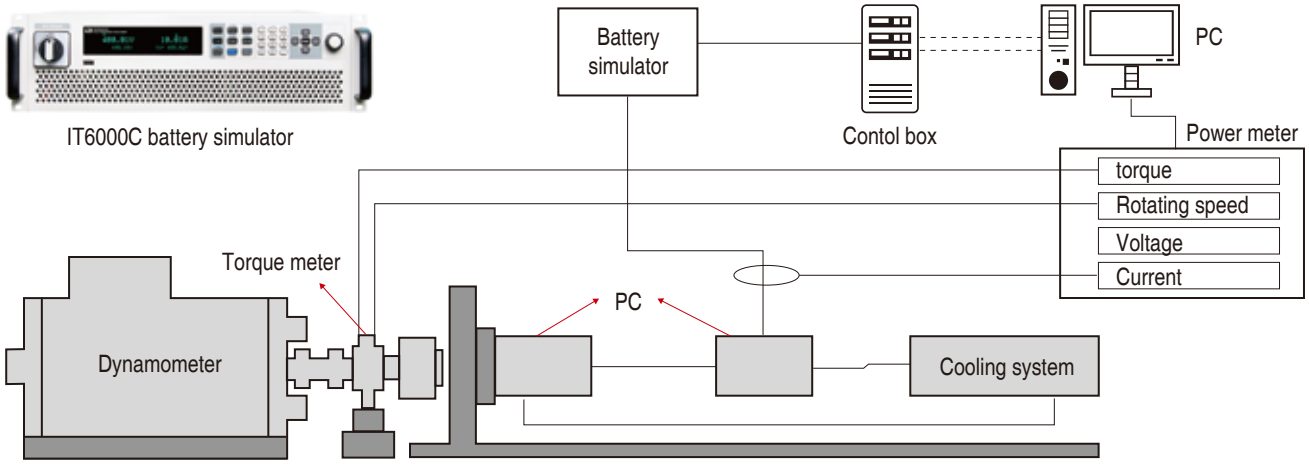
Highlighted features

- Meet the testing needs of DC charging pile modules V2G/V2L.
- IT7900P is a full 4-quadrant regenerative grid simulator that can be used as both a grid simulator and an AC load
- The IT7900P-AC load mode provides CC/CR/CP/RLC load
- which can simulate the inductive/capacitive/resistive loads
- Four output modes: single-phase/three-phase/inverse phase/multi-channel
- Rich waveform editing function, simulating power supply disturbance
- 15kVA in 3U, power extended to 960kVA, no loss after connection in parallel
- Bidirectional DC power supply, regenerative efficiency up to 95% 18kW in 3U, 2250V/1152kW
- Can be used as a battery simulator with seamless current switching
- Equipped with BSS2000 battery simulation software, it can simulate different types of batteries curves
- Built-in CAN/LAN/USB, CANOpen/SCPI protocol are available

EV Test Solution - Powertrain

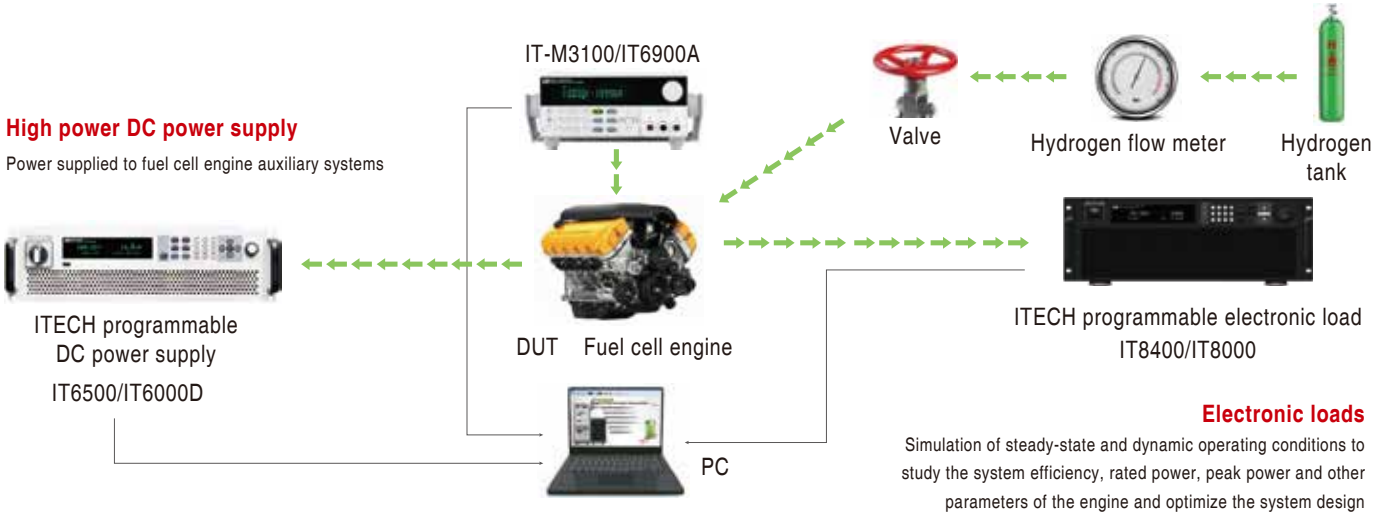
01 E-axle test

ITECH brings fast dynamic response (<2ms) and high power battery simulation solutions for EV powertrain. An integrated source&load unit can automatically absorb the motor's back EMF and protect the DUT. Thanks to the high power density and modular design, ITECH test instruments can be freely connected in parallel to achieve MW level test. In addition, They have built-in CAN, CANOpen protocol, communication baud rate up to 1000K.



02 Fuel cell engine testing

ITECH power supply and electronic load are programmable to simulate drive conditions including steady-state, acceleration and driving under different road conditions. They can meet the diverse testing requirements of high voltage and high power fuel stacks as well as low voltage and high current discharging. The standard size and high power density design are good for rack-mount into 19" cabinets. They provide CAN/LAN/USB interfaces. For secondary development, ITECH provides CANOpen protocol in dbc format.



High power DC power supply

Power supplied to fuel cell engine auxiliary systems

Electronic loads

Simulation of steady-state and dynamic operating conditions to study the system efficiency, rated power, peak power and other parameters of the engine and optimize the system design

03 Wireless charging device testing

Primary side transmitter input characteristics test

IT7800 programmable AC/DC power supply

- Max. power - 960kVA
- Max. voltage - 350V L-N
- Frequency - 10-2400Hz
- List, STEP mode to simulate suddenly power off,surge,rise and fall

IT9100 power analyzer

- Input - 1000Vrms/50A/rms
  Function - Measure/oscilloscope/integration/THD

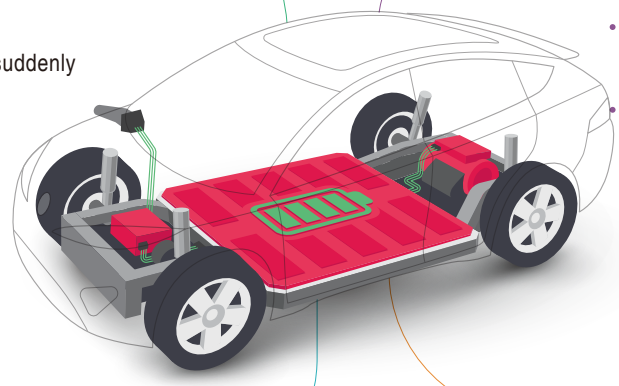
Secondary side receiver output testing

IT8400 programmable electronic load

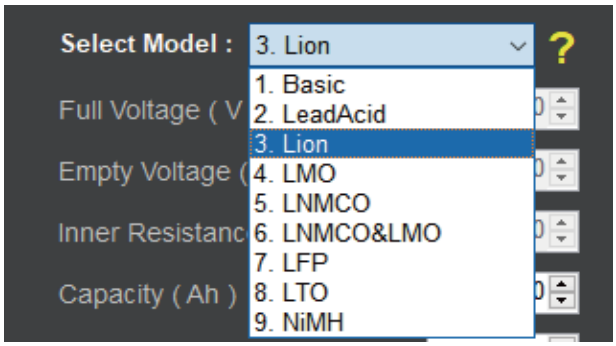
- Power - 6kW-600kW
- Voltage - 600/1200V
- Working mode - CC/CR/CV/CP/CV+CC/CV+CR/CR+CC/CP+CC
- List/dynamic mode

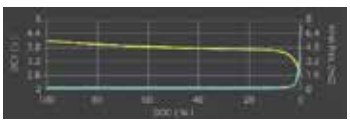
IT6000C+BSS2000

- Power - 5kW-1152kW
- Voltage - 80/300/500/800/1500V
- Function - Built-in battery models, user-defined battery models, Matlab file import

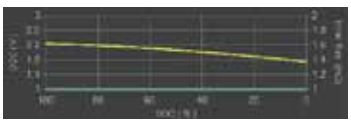


Battery simulation software BSS2000 Pro

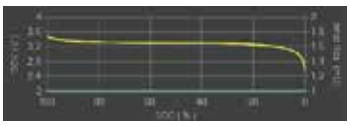




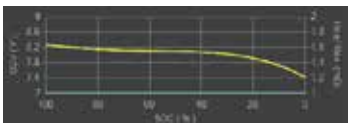
Lithium-ion battery



Lead-acid battery



LFP



NiMH battery

- Built-in battery characteristic curves
- User-defined battery characteristic curves
- Curves generated by mathematical model of batteries
- .mat files can be imported
- SOC settable
- Real-time data display and saving

Power battery test solution

01 BEV battery test

Modular design

- Can be integrated with temperature logger, internal resistance analyzer and temperature chamber
- Connection in parallel between channels to extend higher power
- High power density, MW power can be reached
- High power density design, providing up to MW class battery testing solutions

Multiple list steps

- CC/CV/CP/CR/Pulse
- Driving simulation under real road conditions
- Goto and loop function
- Bms communication, support .Dbc file import
- Statistical analysis and data reporting
- Fast sampling, up to 1ms

ITS5300 battery charge and discharge test system

IT-M3900
bidirectional DC power supply

IT6000C
high power bidirectional DC power supply

Full protection

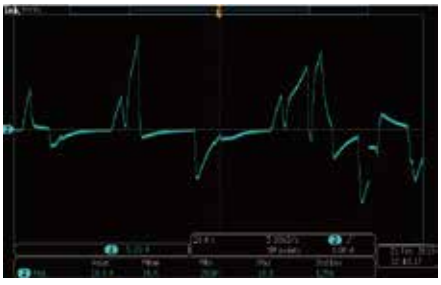
- Anti-crash after power failure
- Anti-reverse connection and anti-sparking
- Emergency stop
- Power abnormal protection
- Overcharge/overdischarge/overtemperature protection

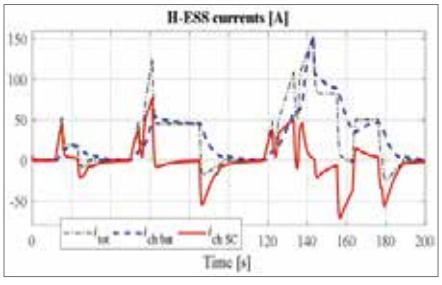
Bidirectional with current seamless switching, regenerative

- Both source and sink, regeneration efficiency is up to 95%max.
- -90%~90% current, less than 2ms of switching

Test item

- Battery capacity/energy test
- Battery life test (dynamic and static)
- SOC verification
- Overcharge and over discharge rate test
- Charge and discharge efficiency test
- Road condition simulation test
- Battery temperature characteristic test
- Hybrid pulse power characteristic test
- BMS interactive test



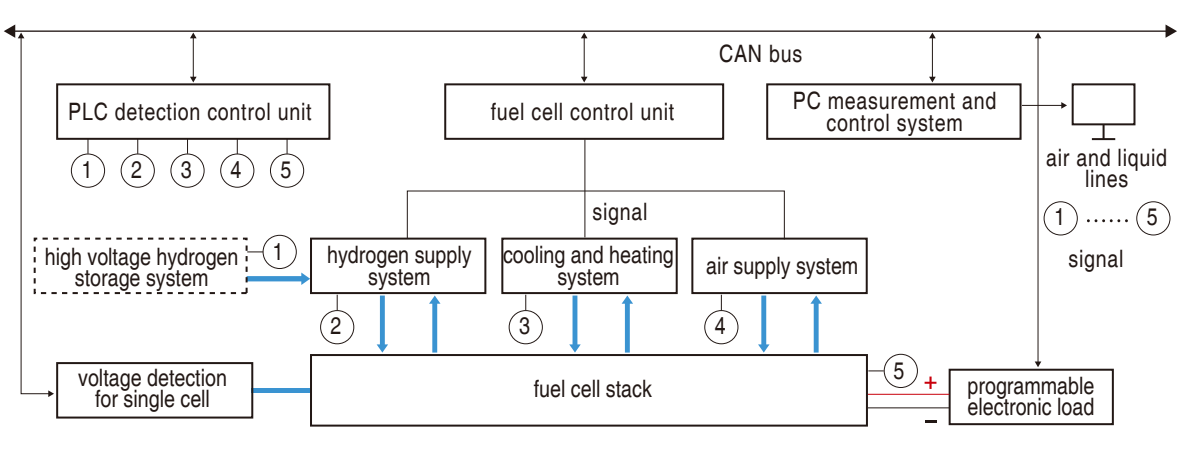


02 FCEV battery test solution

Recommended Models

IT8400
high power DC electronic load

IT8000
regenerative DC electronic load

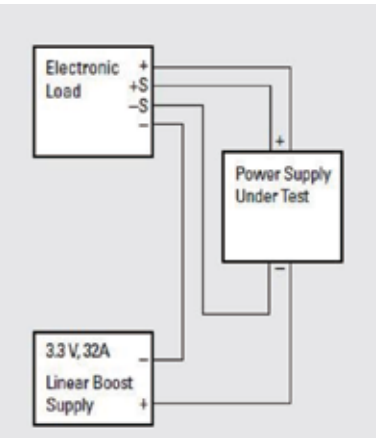


Highlighted advantages

- low IR, well perform the test of fuel cell (low voltage,high current)
- built-in CAN/LAN/USB, provide CANOpen protocol, easy for integration
- high power density, 6kW in 2U height
- high precision measurement, support CC/CV/CP/CR and compound loading modes

03 0V loading test solution of fuel cell

Test solution



Configure	Tips
high voltage power supply （ITM3900D/IT6700H）	choose the power supplies with low voltage but high current choose the power supplies with low noise
electronic load （IT88/IT8900）	choose the electronic loads with low resistance choose the electronic loads whose power are higher than DUT plus auxiliary power

IT-M3900D DC power supply (low voltage with high current)

IT-M3800 regenerative DC electronic load

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