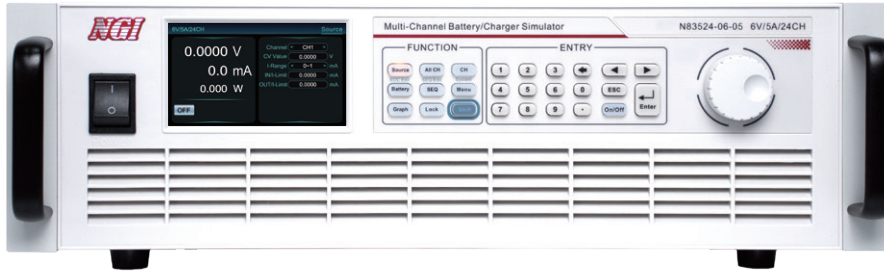# N83524 Series Multi-channel Dual-quadrant Battery Simulator

## Product Introduction

N83524 is a programmable battery simulator with low-power, multi-channel and high-accuracy.  By adopting dual-quadrant design, the current can be charged and discharged, which can satisfy the needs of BMS test and consumer electronics ATE test. Its voltage accuracy is up to 0.6mV, supporting μA-level current measurement, standalone up to 24 channels. The channels are isolated from each other, which is convenient for series connection. N83524 supports both local operation and remote operation via LAN/RS232/CAN interface. N83524 application software is easy to use, which can meet demands of battery simulators in multi-channel, multi-parameter, and complex test environments.

## Application Fields

▶ BMS/CMS test for new energy vehicle, UAV and energy storage

▶ Battery protection board test

▶ Portable consumer electronics R&D and production, such as mobiles, bluetooth earphones, smartwatch, etc.

▶ Electric tools manufacturing test, such as electric screw driver

▶ Power supply to low power products, such as DC-DC, wireless charging products

▶ Battery maintenance device test

## Main Features

▶ Voltage range: 0-6V

▶ Voltage accuracy up to 0.6mV

▶ High integration,standalone up to 24 channels, each channel isolated

▶ μs-level dynamic response, simulating the characteristics of real battery

▶ Optional NB108 series products to achieve fault simulation and nA-level current measurement

▶ Supporting charge mode, battery simulation, SEQ test, SOC test

▶ 4.3 inch high-definition color LCD screen, local/remote control, standard application software

▶ LAN port,RS232 interface,CAN interface; dual LAN ports, convenient for cascade application

▶ Current range: ±1A/±3A/±5A

▶ μA-level current measurement

▶ Voltage ripple noise ≤2mVrms

## Active/passive balancing test

By bidirectional current design, each channel supports up to 5A current input and output. Users can customize the battery charge and discharge model, which fully meets the requirements of BMS active/passive balancing test.
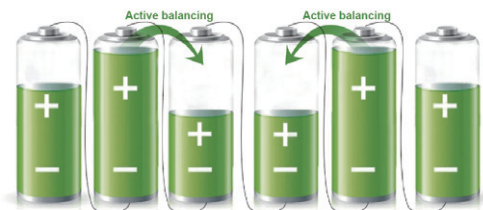
▲ Active Balancing Diagram

## Fast dynamic response

N83524 series has fast dynamic response capability. The response time of load varying from 10% to 90% and voltage recovering within 50mV of previous voltage is less than 100μs, which can ensure the rise and fall waveform of voltage is high-speed and without overshoot, and provide stable output voltage to the DUT.
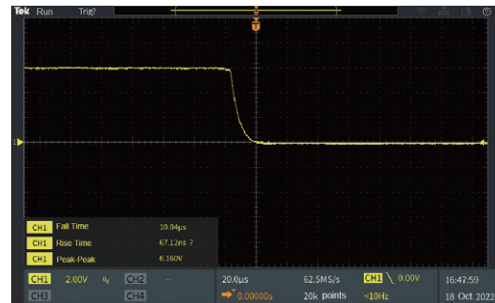


▲ Voltage Ripple Noise ＜2mVrms
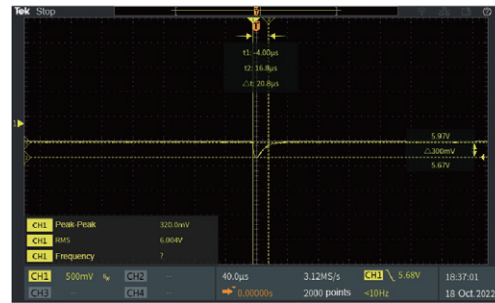


▲ Transient Recovery Time ＜100μs
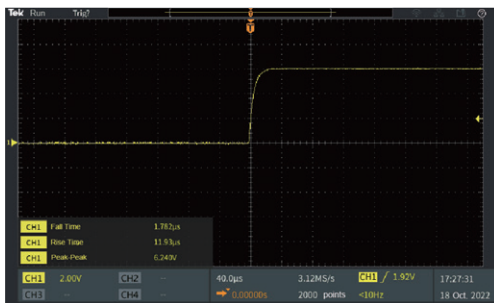


▲ Voltage Rise Time at Full Load ＜40μs



▲ Voltage Fall Time at No Load ＜100μs

## Battery simulation suitable for BMS chips test of various specifications

N83524 series battery simulators have multiple functions and features, supporting Source, Charge, Battery Simulation, SOC Test, SEQ Test, Graph, etc.N83524 can achieve high-precision voltage and current measurements to quickly verify the response of various portable electronic products under different battery conditions.
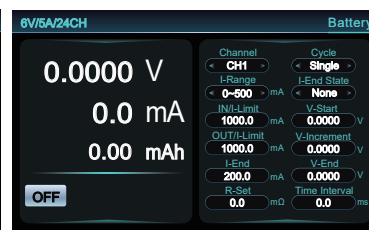
One device can achieve multiple uses, streamline test equipment and optimize test procedures. N83524's internal circuit is optimized for different chips, which can be adapted to test BMS chips of various specifications.
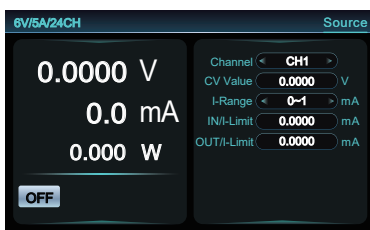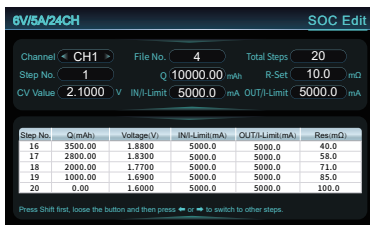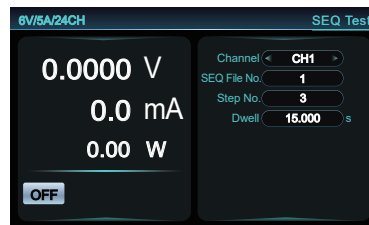


▲ Source
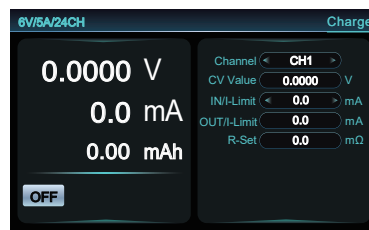


▲ Charge



▲ Battery



▲ SOC Edit



▲ SEQ Test



▲ Graph

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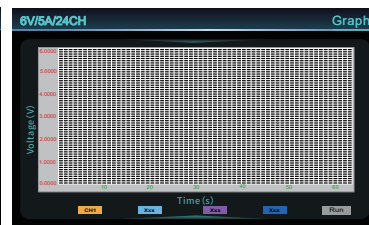
## Optional fault simulation unit

N83524 integrates 24 independent output channels in a 19-inch 3U chassis. By optional NB108-2 fault simulation unit (as shown in the below figure), it can realize simulation of 24-channel built-in positive&negative short circuit, positive&negative open circuit and reverse polarity. By NB108-2, it can improve the integration of test system, reduce complicated wiring, save space and reduce costs for users.

## Product Dimension

Power switch     Function button     Device model
Air outlet    Screen     Numeric button     Knob

Channel interface     Air outlet     AC power socket

CAN port
RS232 interface     LAN port

132.5mm
428mm
465mm
482mm

559mm     33.8mm
132.5mm     57.5mm
44mm
190mm
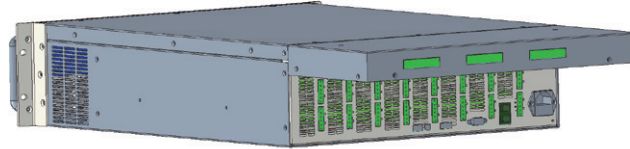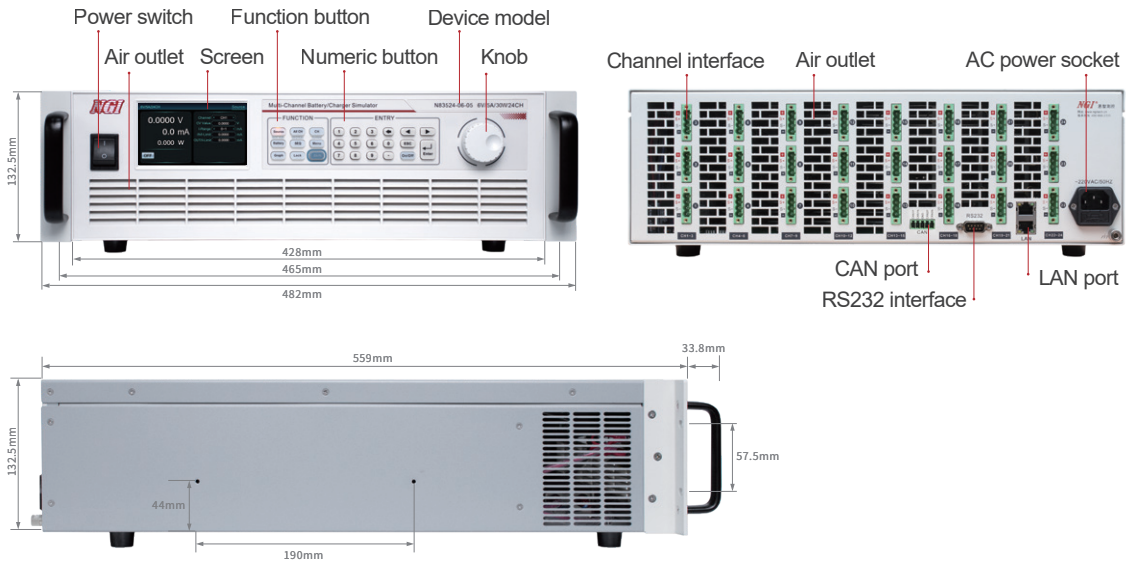
## Technical Data Sheet

| Model | N83524-06-01 | | N83524-06-03 | | N83524-06-05 | |
|---|---|---|---|---|---|---|
| Current | ±1A/CH | | ±3A/CH | | ±5A/CH | |
| Voltage | 6V/CH | | | | | |
| Power | 6W/CH | | 18W/CH | | 30W/CH | |
| Channels | 24CH | | | | | |
| CV Mode | | | | | | |
| Range | 0~6V | | | | | |
| Setting Resolution | 0.1mV | | | | | |
| Setting Accuracy (23±5℃) | 0.6mV | | | | | |
| Readback Resolution | 0.1mV | | | | | |
| Readback Accuracy (23±5℃) | 0.6mV | | | | | |
| Temperature Coefficient (0~40℃) | 20ppm/℃ | | | | | |
| Long-term Stability | 80ppm/1000h | | | | | |
| Voltage Ripple Noise | ≤2mVrms | | | | | |
| CC Mode | | | | | | |
| Range | -1~1A | -1~1mA | -3~3A | -1~1mA | -5~5A | -1~1mA |
| Setting Resolution | 0.1mA | 0.1µA | 0.1mA | 0.1µA | 0.1mA | 0.1µA |
| Setting Accuracy (23±5℃) | 1mA | 1µA | 3mA | 1µA | 5mA | 1µA |
| Readback Resolution | 0.1mA | 0.1µA | 0.1mA | 0.1µA | 0.1mA | 0.1µA |
| Readback Accuracy (23±5℃) | 1mA | 1µA | 3mA | 1µA | 5mA | 1µA |
| Temperature Coefficient (0~40℃) | 30ppm/℃ | | | | | |
| Long-term Stability | 100ppm/1000h | | | | | |
| Dynamic Characteristics | | | | | | |
| Voltage Rise Time | <40µs ( no load ) (10%-90%F.S. Variation Time) | | | | | |
| Voltage Rise Time | <40µs ( pure resistive full load ) (10%-90%F.S. Variation Time) | | | | | |
| Voltage Fall Time | <100µs ( no load ) (90%-10%F.S. Variation Time) | | | | | |
| Voltage Fall Time | <100µs ( pure resistive full load ) (90%-10%F.S. Variation Time) | | | | | |
| Transient Voltage Drop[1] | 350mV | | | | | |
| Transient Recovery Time[2] | <100µs | | | | | |
| Others | | | | | | |
| Load Regulation | 0.01%+0.2mV | | | | | |
| Isolation (Output to ground) | 1500VDC | | | | | |
| Isolation (Inter-channel) | 500VDC | | | | | |
| Communication Response Time | ≤10ms | | | | | |
| Interface | LAN/RS232/CAN | | | | | |
| AC Input | Single phase, 100~240V AC, current≤8A@220V,≤14A@110V, frequency 47Hz~63Hz | | | | | |
| Temperature | Operating temperature: 0℃~40℃,  storage temperature: -20℃~60℃ | | | | | |
| Operating Environment | Altitude <2000m, relative humidity: 5%~90%RH(non-condensing), atmospheric pressure: 80~110kPa | | | | | |
| Net Weight | Approx. 20kg | | | | | |
| Dimension | 3U, 132.5(H)*482.0(W)with handle*559.0(D)mm<br>3U, 132.5(H)*482.0(W)with handle*718.0(D)mm with NB108-2 | | | | | |

Note 1: Load varies from10% to 90% by full voltage output.
Note 2: Load varies from 10% to 90% by full voltage output, with voltage recovering within 50mV of previous voltage.
Note 3: For other specifications, please contact NGI.
Note 4: All specifications are subject to change without notice.

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