N8352 Series High-accuracy Dual-channel Programmable Battery Simulator

Product Introduction

N8352 series is specially designed for the R&D and test of portable battery-operated products, such as Bluetooth headsets, mobiles, AR/VR smart terminals, electric tools, etc. The current flows in both directions and can be used as either a power supply or a load. N8352 is easy to use with touch screen and UI design. The output features are comparable to actual batteries, with fast dynamic response, no overshoot in voltage rise and fall, and stable waveform. The current accuracy is up to μA level, which can test the static power consumption. N8352 is equipped with 4.3 inch touch screen and is with built-in 2-channel DVM, which can be widely used in consumer electronics testing.

N8352 Main Functions

Power Mode

As a dual-channel power supply, users can set output voltage and output current limit value on N8352. N8352 provides multiple current ranges which can improve the output and measurement accuracy.

Battery Simulation

N8352 dual channels provide independent setting of initial voltage, internal resistance, battery capacity and other related parameters, and readback in real time. It can be used to solve the difficulty of parameter uncontrollability for real battery in test and to improve test efficiency.

Fault Simulation

N8352 provides the following fault states: positive & negative polarity open circuit, reverse polarity connection and short circuit.

Application Fields

- 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
- Battery maintenance device test

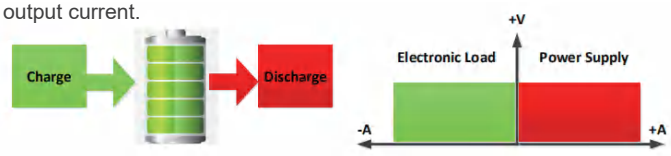
Main Features

- Voltage range：0~6V/0~15V/0~20V
- Voltage accuracy up to 0.6mV
- μA level current measurement
- Ultra-fast dynamic response without overshoot
- Built-in two-channel high-accuracy DVM measurement
- Current range：-1~1A/-2~2A/-3~3A/-5~5A
- Voltage ripple noise low to 2mVrms
- Dual LAN port and RS232 interface
- High definition touch screen

Current flowing in both directions to make N8352 both a power supply and a load

The current flows in both directions. N8352 can both suck and output current.

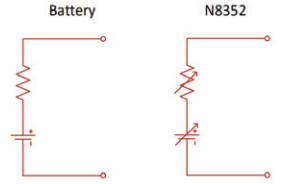
The output terminal has a switch module, which can physically disconnect from the external circuit in the closed state.



▲ N8352 Two-quadrant Operation

Variable output impedance allowing battery internal resistance simulation

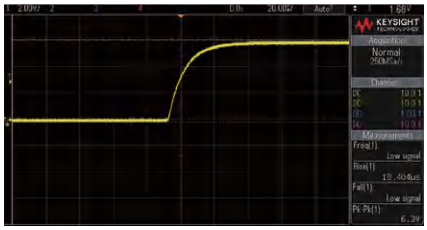
N8352 has the battery internal resistance simulation function, and supports resistance value programming. The programmable range is 0-20Ω, which can emulate the variation graph consistent with the real battery internal resistance characteristics.



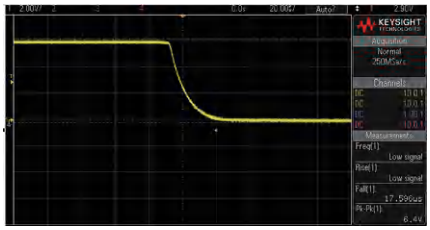
▲ Schematic of Battery and N8532

Ultra-fast transient response without overshoot

N8352 series can ensure there is no overshoot in voltage changes under no-load or loading condition, preventing damage to the DUT due to voltage overcharge and over discharge. It can avoid bad effect to product quality. This feature can meet the demand for product test with strict power requirements.



▲ Loading Rise Time



▲ Loading Fall Time

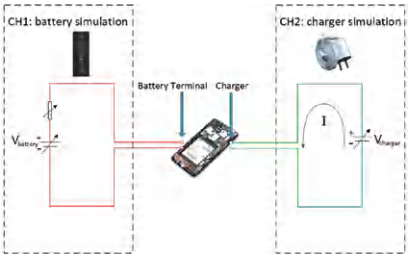
Application--Mobile Test

Most consumer electronics are powered by Li-ion battery, especially smartphones. Battery life issues become prominent. Battery test regulation are becoming stricter. Compared with real battery, it has the following advantages to apply battery simulator. It can emulate the battery change graph and shorten the test cycle. The reliability of test data can be improved by repeated test on a given model.

Both channels of N8352 can charge and discharge. Thus either channel can be used as a power supply, connecting to mobile power terminal. The other channel can be used as a battery, connecting to mobile battery terminal. Both charging and discharging performance can be tested without changing the cables. A single N8352 can be used to test a charge & discharge protection board without additional switches, which greatly reduces the complexity of the test system and improves testing stability and efficiency.

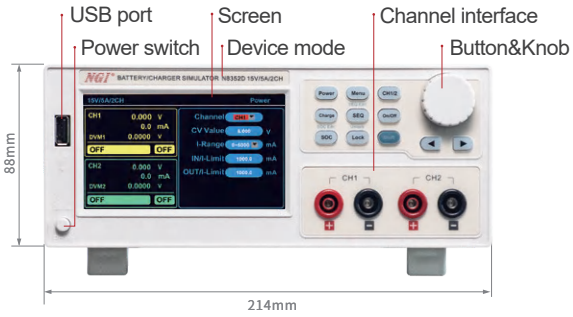
Advantages of battery simulation VS real batteries

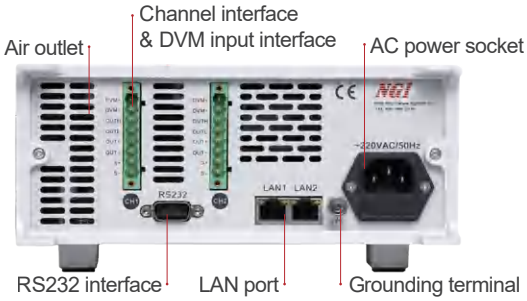
- Suitable for any battery model
- Static power consumption test
- Variable internal resistance output function
- Built-in fault simulation
- The initial point of battery simulation can be set arbitrarily
- Powerful protection functions, without battery safety hazards and risks

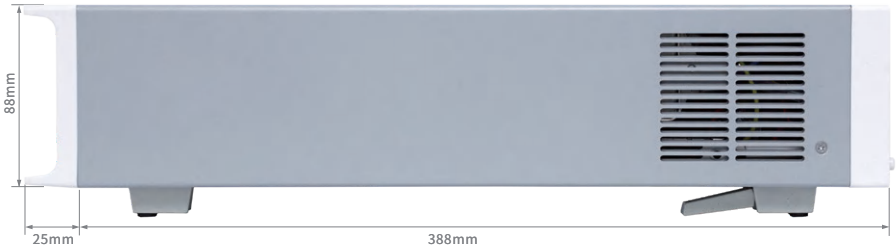


▲ Function Test of Charge & Discharge Protection Board

Product Dimension







Technical Data Sheet(1)

Model	N8352A	N8352B	N8352C
Current	±1A/CH	±2A/CH	±3A/CH
Voltage	6V/CH	6V/CH	6V/CH
Power	6W/CH	12W/CH	18W/CH
Channels	2CH		
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		
Output Voltage Settling Time	≤10ms		
Load Regulation	0.01%+1mV		
Line Regulation	0.01%+0.1mV		
Ripple Noise (20Hz-20MHz)	≤2mVrms		
Temperature Coefficient (0~40℃)	25ppm/℃		
Current Measurement			
Range 1			
Range	-1~1A	-2~2A	-3~3A
Resolution	0.1mA		
Accuracy (23±5℃)	1mA+2d	2mA+2d	3mA+2d
Temperature Coefficient (0~40℃)	50ppm/℃		
Range 2			
Range	-100~100mA	-200~200mA	-300~300mA
Resolution	10μA		
Accuracy (23±5℃)	100μA	200μA	300μA
Temperature Coefficient (0~40℃)	50ppm/℃		
Range 3			
Range	-1~1mA		
Resolution	0.1μA		
Accuracy (23±5℃)	1μA		
Temperature Coefficient (0~40℃)	50ppm/℃		
Current Protection Limit			
Range	-1~1A	-2~2A	-3~3A
Setting Resolution	0.1mA		
Setting Accuracy (23±5℃)	1mA	2mA	3mA
Temperature Coefficient (0~40℃)	50ppm/℃		
DVM Function			
Channels	2CH	Measurement Accuracy	±0.01%F.S.
Voltage Range	-30V~+30V	Measurement Frequency	4Hz
Measurement Resolution	0.1mV	Input Impedance	2MΩ
Terminal	Pluggable terminal	Temperature Coefficient (0~40℃)	30ppm/℃
Dynamic Characteristics			
Voltage Rise Time (10%-90%F.S. Variation Time)	<40μs (no load)	Voltage Rise Time (10%-90%F.S. Variation Time)	<40μs (pure resistive full load)
Voltage Fall Time (90%-10%F.S. Variation Time)	<100μs (no load)	Voltage Fall Time (90%-10%F.S. Variation Time)	<100μs (pure resistive full load)
Transient Voltage Drop [1]	200mV	Transient Recovery Time[2]	<100μs
Others			
Communication Response Time	≤10ms		
Interface	LAN/RS232		
AC Input	Single phase 100~240V AC, frequency 47Hz~63Hz, current ≤2A@220V, ≤4A@110V		
Temperature	Operating temperature: 0℃~40℃, storage temperature: -20℃~60℃		
Operating Environment	Altitude <2000m, relative humidity: 5%~90%RH(non-condensing), atmospheric pressure: 80~110kPa		
Dimension	2U, 88.0(H)*214.0(W)*388.0(D)mm	Net Weight	Approx. 3.3kg

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.

Technical Data Sheet(2)

Model	N8352D	N8352E	N8352F
Current	±5A/CH	±1A/CH	±3A/CH
Voltage	15V/CH	20V/CH	20V/CH
Power	75W/CH	20W/CH	60W/CH
Channels	2CH		
CV Mode			
Range	0~15V	0~20V	
Setting Resolution	0.1mV		
Setting Accuracy (23±5℃)	1.5mV	2mV	
Readback Resolution	0.1mV		
Readback Accuracy (23±5℃)	1.5mV	2mV	
Output Voltage Settling Time	≤10ms		
Load Regulation	0.01%+2mV		
Line Regulation	0.01%+0.2mV		
Ripple Noise (20Hz-20MHz)	≤5mVrms	≤7mVrms	
Temperature Coefficient (0~40℃)	25ppm/℃		
Current Measurement			
Range 1			
Range	-5~5A	-1~1A	-3~3A
Resolution	0.1mA		
Accuracy (23±5℃)	5mA	1mA	3mA
Temperature Coefficient (0~40℃)	50ppm/℃		
Range 2			
Range	-500~500mA	-100~100mA	-300~300mA
Resolution	10μA		
Accuracy (23±5℃)	500μA	100μA	300μA
Temperature Coefficient (0~40℃)	50ppm/℃		
Range 3			
Range	-1~1mA		
Resolution	0.1μA		
Accuracy (23±5℃)	1μA		
Temperature Coefficient (0~40℃)	50ppm/℃		
Current Protection Limit			
Range	-5~5A	-1~1A	-3~3A
Setting Resolution	0.1mA		
Setting Accuracy (23±5℃)	5mA	1mA	3mA
Temperature Coefficient (0~40℃)	50ppm/℃		
DVM Function			
Channels	2CH	Measurement Accuracy	±0.01%F.S.
Voltage Range	-30V~+30V	Measurement Frequency	4Hz
Measurement Resolution	0.1mV	Input Impedance	2MΩ
Terminal	Pluggable terminal	Temperature Coefficient (0~40℃)	30ppm/℃
Dynamic Characteristics			
Voltage Rise Time (10%-90%F.S. Variation Time)	<40μs (no load)	Voltage Rise Time (10%-90%F.S. Variation Time)	<40μs (pure resistive full load)
Voltage Fall Time (90%-10%F.S. Variation Time)	<100μs (no load)	Voltage Fall Time (90%-10%F.S. Variation Time)	<100μs (pure resistive full load)
Transient Voltage Drop [1]	400mV	Transient Recovery Time[2]	<200μs
Others			
Communication Response Time	≤10ms		
Interface	LAN/RS232		
AC Input	Single phase 100~240V AC, frequency 47Hz~63Hz, current ≤2A@220V, ≤4A@110V		
Temperature	Operating temperature: 0℃~40℃, storage temperature: -20℃~60℃		
Operating Environment	Altitude <2000m, relative humidity: 5%~90%RH(non-condensing), atmospheric pressure: 80~110kPa		
Dimension	2U, 88.0(H)*214.0(W)*388.0(D)mm	Net Weight	Approx. 3.3kg

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