

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 μ A 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

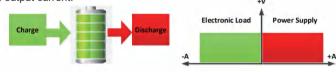
- Voltage range: 0~6V/0~15V/0~20V
- ► Voltage accuracy up to 0.6mV
- μA level current measurement
- Ultra-fast dynamic response without overshoot
- Built-in two-channel high-accuracy DVM measurement
- Current range: -1~1A/-2~2A/-3~3A/-5~5A
- ▶ Voltage ripple noise low to 2mVrms
- ▶ Dual LAN port and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

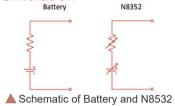
The output terminal has a switch module, which can physically disconnect from the external circuit in the closed state.



▲ N8352 Two-quadrant Operation

Variable output impedance allowing battery internal resistance simulation

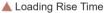
N8352 has the battery internal resistance simulation function, and supports resistance value programming. The programmable range is $0-20\Omega$, which can emulate the variation graph consistent with the real battery internal resistance characteristics.

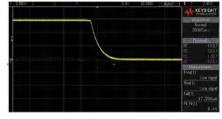


Ultra-fast transient response without overshoot

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 Fall Time

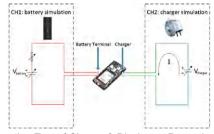
Application--Mobile Test

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

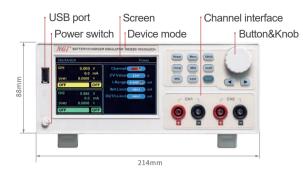
- Suitable for any battery model
- ▶ Static power consumption test
- Variable internal resistance output function
- Built-in fault simulation
- The initial point of battery simulation can be set arbitrarily
- Powerful protection functions, without battery safety hazards and risks

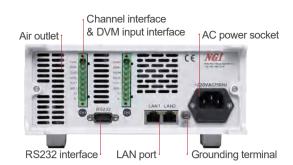


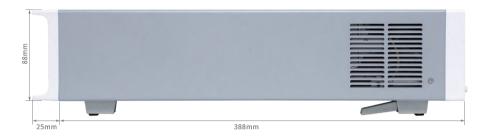
▲ Function Test of Charge & Discharge Protection Board



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	000/011	2CH		1000/011		
CV Mode						
Range	9.	0~6V				
Setting Resolution		0.1mV				
Setting Accuracy (23±5°C)		0.6mV				
Readback Resolution	0.5mV 0.1mV					
Readback Accuracy (23±5℃)	0.111V 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°C)	25ppm/℃					
Current Measurement						
Range 1						
Range	-1~1A	-2~2A		-3~3A		
Resolution		0.1mA				
Accuracy (23±5°C)	1mA+2d	2mA+2d		3mA+2d		
Temperature Coefficient (0~40°C)		50ppm/℃				
	Ra	nge 2				
Range	-100~100mA	-200~200mA		-300~300mA		
Resolution		10µA				
Accuracy (23±5℃)	100µA	200µA		300μΑ		
Temperature Coefficient (0~40°C)	•	50ppm/℃		·		
	Ra	nge 3				
Range		-1~1mA				
Resolution		0.1µA				
Accuracy (23±5℃)		1µA				
Temperature Coefficient (0~40°C)		50ppm/℃				
	Current Pr	otection Limit				
Range	-1~1A	-2~2A		-3~3A		
Setting Resolution		0.1mA				
Setting Accuracy (23±5℃)	1mA	2mA		3mA		
Temperature Coefficient (0~40°C)	50ppm/℃					
		Function				
Channels	2CH	Measurement Accura		±0.01%F.S.		
Voltage Range	-30V~+30V	Measurement Freque	ency	4Hz		
Measurement Resolution	0.1mV	Input Impedance		2ΜΩ		
Terminal	Pluggable terminal	Temperature Coefficient (0-	~40°C)	30ppm/℃		
	Dynamic C	haracteristics				
Voltage Rise Time (10%-90%F.S. Variation Time)	<40µs (no load)	Voltage Rise Time (10%-90%F.S. Variation Time) Voltage Fall Time (90%-10%F.S. Variation Time)		s (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)	<100µ	s (pure resistive full load)		
Transient Voltage Drop 1	200mV	Transient Recovery Time ²		<100µs		
Communication Descriptor Times	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°C~40°C, storage temperature: -20°C~60°C					
On a ration Francisco and		Altitude <2000m, relative humidity: 5%~90%RH(non-condensing), atmospheric pressure: 80~110kPa 2U, 88.0(H)*214.0(W)*388.0(D)mm Net Weight Approx. 3.3kg				
Operating Environment Dimension			lensing), a			

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)

SANCH	Model	N8352D	N8352E	N8352F				
Voltage								
Power 75W/CH 20W/CH 60W/CH Channels 2CH								
Channels								
Range		70117011		3377,311				
Range 0~15V 0.1mV	Ond in old							
Setting Resolution Setting Accuracy (23±5°C) 1.5mV 2mV 2mV Readback Resolution 0.1mV Setting Accuracy (23±5°C) 1.5mV 2mV	Range							
Setting Accuracy (23±5°C)		0 100		201				
Readback Accuracy (23±5°C) 1.5mV 2mV 2		1.5m\/		m\/				
Readback Accuracy (23±5°C) 1.5mV 2mV								
Subject								
Line Regulation 0.01%+2mV 0.01%+0.2mV Ripple Noise (20Hz-20MHz) ≤5mVrms ≤5mVrms ≤5pm/°C 25pm/°C 25pm/°C 25pm/°		1.01114						
Line Regulation Ripple Noise (20Hz-20MHz) ≤5mVrms		+						
Ripple Noise (20Hz-20MHz) SmVrms 25ppm/°C								
Range -5-5A -1-1A -3-3A		z) ≤5mVrms						
Current Measurement Range 1			-					
Range -5~5A								
Range -5~5A -1~1A -3~3A Resolution 0.1mA 3mA Accuracy (23±5°C) 5mA 1mA 3mA Temperature Coefficient (0~40°C) 8mage 2 -500~500mA -100~100mA -300~300mA Resolution 10µA 300µA 300µA 300µA Accuracy (23±5°C) 500µA 100µA 300µA Temperature Coefficient (0~40°C) 8mage 3 -1-1mA -1-1mA Resolution 0.1µA -1-1mA -1-1-1mA -1-1-1mA </td <td colspan="7"></td>								
Resolution	Range			-3~3A				
Accuracy (23±5℃) 5mA 1mA 3mA Temperature Coefficient (0~40℃) 50ppm/℃ Range -500~500mA -100~100mA -300~300mA Resolution 10µA 300µA 300µA Temperature Coefficient (0~40℃) 50ppm/℃ 50ppm/℃ Range 3 Range -1~1mA -1~1mA Resolution 0.1µA -4.2 Accuracy (23±5℃) 1µA -5.2 Temperature Coefficient (0~40℃) 50ppm/℃ -7.2 Range -5.5A -1~1A -3~3A Setting Resolution 0.1mA 3mA Setting Resolution 0.1mA 3mA Setting Accuracy (23±5℃) 5mA 1mA 3mA Temperature Coefficient (0~40℃) 5mA 1ma 3mA Temperature Coefficient (0~40℃) <t< td=""><td></td><td></td><td></td><td></td></t<>								
Range 2		5mA		3mA				
Range		0		0.1.2.1				
Range	(Ra						
Resolution	Range		_,~	-300~300mA				
Accuracy (23±5°C) 500μA 100μA 300μA 300μA Temperature Coefficient (0~40°C) 8								
Range		500uA		300uA				
Range 3 Range -1~1mA Resolution 0.1μA Accuracy (23±5°C) 1μA Temperature Coefficient (0~40°C) 50ppm/°C Current Protection Limit Range -5~5A -1~1A -3~3A Setting Resolution 0.1mA Setting Accuracy (23±5°C) 5mA 1mA 3mA Temperature Coefficient (0~40°C) 50ppm/°C 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°C) 30ppm/°C Dynamic Characteristics Voltage Rise Time (10%+90%+5. Variation Time) (10%+90%+5. Variation Time) (10%+90%+5. Variation Time) (100µs (no load)) (10%+90%+5. Variation Time) (100µs (no load)) (100%+00%+5. Variation Time) (100µs (no load)) Transient Voltage Drop¹ 400mV Transient Recovery Time (100µs (pure resistive full load)) Communication Response Time 100µs (no load) (100%+00%+5. Variation Time) (100µs (pure resistive full load)) Communication Response Time 100µs (no load) (100%+00%+5. Variation Time) (100µs (pure resistive full load)) Communication Response Time 100ms Interface LAN/RS232 AC Input Single phase 100~240V AC, frequency 47Hz~63Hz, current ≤2A@220V, ≤4A@110V Temperature Operating temperature: 0°C~40°C, storage temperature: -20°C~60°C		- σσσμ. τ		σοσμ. τ				
Range Resolution Resolution Accuracy (23±5°C) Temperature Coefficient (0~40°C) Range Setting Resolution Setting Resolution Setting Resolution Setting Accuracy (23±5°C) Temperature Coefficient (0~40°C) Setting Resolution Setting Accuracy (23±5°C) SmA Temperature Coefficient (0~40°C) Soppm/°C DVM Function Channels Channels Channels CH Measurement Accuracy Measurement Resolution 0.1mV Measurement Resolution Terminal Pluggable terminal Temperature Coefficient (0~40°C) Resolution Terminal Pluggable terminal Temperature Coefficient (0~40°C) Topynamic Characteristics Voltage Rise Time (10%-90%F.S. Variation Time) (10%-90%F.S. Variation Time) Voltage Rise Time (10%-90%F.	Tompolataro Geomolom (* 14 6)	Ra						
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Range								
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Temperature Coefficient (0~40℃) DVM Function Channels 2CH Measurement Accuracy ±0.01%F.S. Voltage Range -30V~+30V Measurement Frequency 4Hz Measurement Resolution 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 Drop¹ 400mV Transient Recovery Time² <200µs Communication Response Time 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℃			0.1mA					
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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°C) 30ppm/°C Dynamic Characteristics Voltage Rise Time (10%-90%F.S. Variation Time) <40μs (no load)	Temperature Coefficient (0~40℃)		50ppm/℃					
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Dynamic Characteristics Voltage Rise Time (10%-90%F.S. Variation Time)	Measurement Resolution	2CH -30V~+30V	Measurement Accuracy					
Voltage Rise Time (10%-90%F.S. Variation Time)	Terminal	2CH -30V~+30V	Measurement Accuracy Measurement Frequency	4Hz				
Transient Voltage Drop 400mV Transient Recovery Time ² <200μs		2CH -30V~+30V n 0.1mV	Measurement Accuracy Measurement Frequency Input Impedance	4Hz 2MΩ				
Transient Voltage Drop 400mV Transient Recovery Time ² <200μs	(10%-90%F.S. Variation Time)	2CH -30V~+30V n 0.1mV Pluggable terminal Dynamic C	Measurement Accuracy Measurement Frequency Input Impedance Temperature Coefficient (0~40°C)	4Hz 2MΩ				
Transient Voltage Drop 400mV Transient Recovery Time ² <200μs		2CH -30V~+30V n 0.1mV Pluggable terminal Dynamic C	Measurement Accuracy Measurement Frequency Input Impedance Temperature Coefficient (0~40°C)	4Hz 2MΩ 30ppm/°C				
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AC Input Single phase 100~240V AC, frequency 47Hz~63Hz, current ≤2A@220V, ≤4A@110V Temperature Operating temperature: 0°C~40°C, storage temperature: -20°C~60°C	(90%*10%F.S. Variation Time) Transient Voltage Drop 1	2CH -30V~+30V n 0.1mV Pluggable terminal Dynamic C <40µs (no load) <100µs (no load) 400mV Ot	Measurement Accuracy Measurement Frequency Input Impedance Temperature Coefficient (0~40°C) Characteristics Voltage Rise Time (10%-90%F.S. Variation Time) Voltage Fall Time (90%-10%F.S. Variation Time) Transient Recovery Time ² hers	4Hz 2MΩ 30ppm/℃ 40μs (pure resistive full load) 00μs (pure resistive full load)				
Temperature Operating temperature: 0°C~40°C, storage temperature: -20°C~60°C	(90%-10%F.S. Variation Time) Transient Voltage Drop Communication Response Time	2CH -30V~+30V n 0.1mV Pluggable terminal Dynamic C <40µs (no load) <100µs (no load) 400mV Ot	Measurement Accuracy Measurement Frequency Input Impedance Temperature Coefficient (0~40℃) Characteristics Voltage Rise Time (10%-90%F.S. Variation Time) Voltage Fall Time (90%-10%F.S. Variation Time) Transient Recovery Time thers ≤10ms	4Hz 2MΩ 30ppm/℃ 40μs (pure resistive full load) 00μs (pure resistive full load)				
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On and the Freedom and ANN 1 2000 1 11 1 1 11 70 200 PM	(90%-10%F.S. Variation Time) Transient Voltage Drop Communication Response Time Interface AC Input	2CH -30V~+30V n 0.1mV Pluggable terminal Dynamic C <40µs (no load) <100µs (no load) 400mV Ot Single phase 100~240V A	Measurement Accuracy Measurement Frequency Input Impedance Temperature Coefficient (0~40°C) Characteristics Voltage Rise Time (10%-90%F.S. Variation Time) <100%-10%F.S. Variation Time) Transient Recovery Time² LAN/RS232 AC, frequency 47Hz~63Hz, curi	4Hz 2MΩ 30ppm/°C 40μs (pure resistive full load) 00μs (pure resistive full load) <200μs rent ≤2A@220V, ≤4A@110V				
	(90%-10%F.S. Variation Time) Transient Voltage Drop Communication Response Time Interface AC Input Temperature	2CH -30V~+30V n 0.1mV Pluggable terminal Dynamic C <40µs (no load) <100µs (no load) 400mV Ot Single phase 100~240V A Operating tempera	Measurement Accuracy Measurement Frequency Input Impedance Temperature Coefficient (0~40°C) Characteristics Voltage Rise Time (10%-90%F.S. Variation Time) <1 Voltage Fall Time (90%-10%F.S. Variation Time) <1 Transient Recovery Time² LAN/RS232 AC, frequency 47Hz~63Hz, currenter.	4Hz 2MΩ 30ppm/°C 40μs (pure resistive full load) 00μs (pure resistive full load) <200μs rent ≤2A@220V, ≤4A@110V erature: -20°C~60°C				
Dimension 2U, 88.0(H)*214.0(W)*388.0(D)mm Net Weight Approx. 3.3kg	(90%-10%F.S. Variation Time) Transient Voltage Drop Communication Response Time Interface AC Input Temperature Operating Environment	2CH -30V~+30V n 0.1mV Pluggable terminal Dynamic C <40µs (no load) <100µs (no load) 400mV Ot Single phase 100~240V A Operating tempera Altitude <2000m, relative humidir	Measurement Accuracy Measurement Frequency Input Impedance Temperature Coefficient (0~40℃) Characteristics Voltage Rise Time (10%-90%F.S. Variation Time) Voltage Fall Time (90%-10%F.S. Variation Time) Transient Recovery Time ≤10ms LAN/RS232 AC, frequency 47Hz~63Hz, currature: 0°C~40°C, storage temp ty: 5%~90%RH(non-condensing),	4Hz 2MΩ 30ppm/°C 40μs (pure resistive full load) 00μs (pure resistive full load) <200μs rent ≤2A@220V, ≤4A@110V erature: -20°C~60°C atmospheric pressure: 80~110kPa				

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.