

# N3410 Series Triple-channel Programmable DC Power Supply



### **Product Introduction**

N3410 series is a triple-channel programmable DC power supply with high performance and high reliability. N3410 is with half 19 inch 2U size, integrating three independent output channels, and supporting both front and rear wiring. It has compact size and elegant appearance. N3410 supports both benchtop application with carrying handle and tilt stand, and supports rack installation for system integration. Test and measurement information is displayed intuitively on the 4.3 inch LCD screen. It provides DVM measurement as an optional function to meet different test demands.

### **Application Fields**

- Higher education laboratory
- Production line inspection

- R&D laboratory
- Maintenance test

#### **Main Features**

- ▶ Voltage range: 6V/32V/60V, supporting series connection to increase voltage
- Current range: 3A/5A, supporting parallel connection to increase current
- 3 channels in a standalone, each channel isolated
- Low ripple&noise
- ► High accuracy and resolution, as low as 0.1mV/0.1mA
- Dynamic response time less than 1ms
- Supporting series, parallel and trace output modes
- ► High accuracy DVM measurement (for N3411P/N3412P/N3413P only) OTP, OCP, OVP functions are supportable
- ▶ 4.3 inch LCD screen, supporting screenshot via USB port
- Remark 1: N3411E/N3412E/N3413E are with 10mV/1mA resolution.
- Remark 2: SEQ is not available for N3411E/N3412E/N3413E.
- Remark 3: Graph is not available for N3411E/N3412E/N3413E.

- Sequence(SEQ) test function
- Graph for real-time output waveform display
- ► Half 19 inch 2U size with tilt stand
- Front and rear output terminals
- LAN port and RS232 interface

## Front and rear wiring design

N3410 series supports both front and rear panel wiring. User can place N3410 on the bench top or integrate it on the rack, which brings a convenient experience.

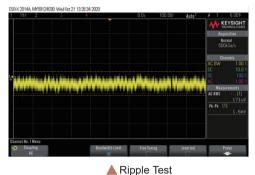






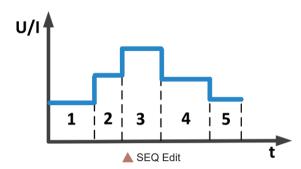
### High accuracy and low ripple

N3410 has excellent performance in output accuracy. It also has ultra-low ripple &noise. The ripple Vrms is less than 400 $\mu$ V, and Vp-p less than 5mV.



#### **SEQ** test function

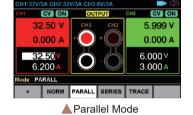
N3410 series supports sequence edit. Users can set the output voltage, output current and single step running time. 100 groups of voltage and current sequences can be user-defined. Sequence files can also be imported through the USB type-A interface on front panel.

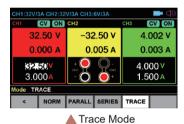


## Series, parallel and trace output modes

N3410 series has three output modes: CH1/CH2 series, parallel and trace, which can be switched on the front panel, without external serial and parallel wiring, to meet the needs of different ranges and voltage output.







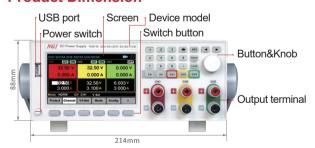
DVM measurement (for N3411P/N3412P/N3413P only)

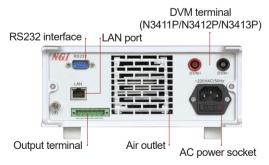
N3411P/N3412P/N3413P have built-in one channel high-accuracy DVM to test external voltage, with range of -600V~+600V. It has three automatic ranges: ±600V/±60V/±6V, with measurement accuracy of 0.01% F.S., and measurement resolution of 5½ digit. The measurement data is refreshed on the HD screen in real time, which is convenient to observe the voltage variation.

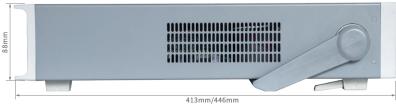
### Graph

Graph can be used to display the output waveform in real time. The waveform display content can be edited, such as voltage-time, current-time, power-time, etc.

#### **Product Dimension**









# **Technical Data Sheet (1)**

| Model  | N3411/  | /N3411P                        | N3412/         | N3412P           |
|--|---|--------------------------------|----------------|------------------|
| Channel  | CH1/CH2   | CH3                            | CH1/CH2        | CH3              |
| Voltage  | 32V   | 6V                             | 32V            | 6V               |
| Current  | 3A  | 3A                             | 5A             | 3A               |
| Series Mode-Voltage  | 64V   | N/A                            | 64V            | N/A              |
| Parallel Mode-Current                                      | 6A  | N/A                            | 10A            | N/A              |
| Total Power  | 210W  |                                | 338W           |                  |
| Setting Resolution-Voltage                                 | 0.1mV   | 1mV                            | 0.1mV          | 1mV              |
| Setting Resolution-Current                                 | 0.1mA   | 1mA                            | 0.1mA          | 1mA              |
| Setting Accuracy-Voltage (23±5°C)                          | < 0.01% + 10mV  |                                | < 0.01% + 10mV | < 0.03% + 10mV   |
| Setting Accuracy-Current (23±5°C)                          | < 0.05% + 5mA   | <0.03% + 10mV<br><0.05% + 10mA | < 0.05% + 10mA | < 0.05% + 10mA   |
| Setting Temperature Coefficient                            | ₹0.0570 T SITIA   |                                | pm/℃           | <0.0370 1 TOTTIA |
| Readback Resolution-Voltage                                | 0.4\/   |                                |                | 4 1/             |
|  | 0.1mV   | 1mV                            | 0.1mV          | 1mV              |
| Readback Resolution-Current                                | 0.1mA   | 1mA                            | 0.1mA          | 1mA              |
| Readback Accuracy-Voltage (23±5°C)                         | < 0.01% + 10mV  | < 0.03% + 10mV                 | < 0.01% + 10mV | < 0.03% + 10mV   |
| Readback Accuracy-Current (23±5°C)                         | < 0.05% + 5mA   | < 0.05% + 10mA                 | < 0.05% + 10mA | < 0.05% + 10mA   |
| Readback Temperature Coefficient                           |   | <u></u>                        | om/℃           |                  |
| Long-term Stability  |   |                                | m/1000h        | 1                |
| Voltage Ripple Noise (20Hz ~ 20MHz)                        | ≤5mVp-p   | ≤10mVp-p                       | ≤5mVp-p        | ≤10mVp-p         |
| Voltage Ripple Noise (20Hz ~ 20MHz)                        | ≤1mVrms   |                                |                |                  |
| Current Ripple Noise (20Hz ~ 20MHz)                        |   | ≤3m                            | Arms           |                  |
|  | Dynamic Chara   | cteristics                     |                |                  |
| Voltage Rise Time (no load) (10%-90%F.S. Variation Time)   | 20ms  | 20ms                           | 20ms           | 20ms             |
| Voltage Rise Time (full load) (10%-90%F.S. Variation Time) | 50ms  | 21ms                           | 50ms           | 21ms             |
| Voltage Fall Time (no load) (90%-10%F.S. Variation Time)   | 400ms   | 200ms                          | 400ms          | 200ms            |
| Voltage Fall Time (full load) (90%-10%F.S. Variation Time) | 45ms  | 13ms                           | 45ms           | 13ms             |
| Transient Recovery Time                                    |   | ≤1r                            | ns             |                  |
| Line Regulation-Voltage                                    | ≤0.01%+1mV  | ≤0.01%+3mV                     | ≤0.01%+1mV     | ≤0.01%+3mV       |
| Line Regulation-Current                                    | ≤0.01%+1mA  | ≤0.02%+3mA                     | ≤0.01%+3mA     | ≤0.02%+3mA       |
| Load Regulation-Voltage                                    |   | ≤0.01%                         | 6+3mV          |                  |
| Load Regulation-Current                                    | ≤0.01%+3mA  | ≤0.02%+3mA                     | ≤0.01%+3mA     | ≤0.02%+3mA       |
|  |   | N3411P/N3412P                  |                | =010270 011111   |
| Channels   | 1CH   |                                |                |                  |
| Voltage Range  | ±600V/±6V   |                                |                |                  |
| Measurement Resolution                                     | 5½ digits   |                                |                |                  |
| Measurement Accuracy                                       | 0.01% + 0.01%F.S.   |                                |                |                  |
| Measurement Frequency                                      | 4Hz   |                                |                |                  |
| Input Impedance  | 10ΜΩ  |                                |                |                  |
| Terminal   | Pluggable terminal  |                                |                |                  |
| Temperature Coefficient (0~40°C)                           | 20ppm/℃   |                                |                |                  |
|  | Others  |                                |                |                  |
| Isolation (Output to Ground)                               |   | 500V DC                        |                |                  |
| Communication Response Time                                | ≤5ms  |                                |                |                  |
| Interface<br>AC Input                                      | LAN/RS232   |                                |                |                  |
| -  | Single phase, 220V AC±10%, frequency 47Hz~63Hz  |                                |                |                  |
| Temperature Operating Environment                          | Operating temperature: 0°C~40°C, storage temperature: -20°C~60°C  Altitude <2000m, relative humidity: 5%~90%RH(non-condensing), atmospheric pressure: 80~110kPa |                                |                |                  |
| Net Weight   |   |                                |                |                  |
| Dimension  | 11 0  |                                |                |                  |
| DIIIOIBIOII  | 2U, 88.0(H)*214.0(W)*413.0(D)mm 2U, 88.0(H)*214.0(W)*446.0(D)mm   |                                |                |                  |

Note 1: For other specifications, please contact NGI.

Note 2: All specifications are subject to change without notice.



## **Technical Data Sheet (2)**

| Channel   CH1/CH2  | Model  | N3413/N3413P                   |                |  |
|--|--|--------------------------------|----------------|--|
| Solution   |  |                                |                |  |
| Current         3A         3A           Series Mode-Voltage         120V         N/A           Parallel Mode-Current         6A         N/A           Total Power         378W           Setting Resolution-Voltage         0.1mV         1mV           Setting Resolution-Current         0.1mA         1mA           Setting Accuracy-Voltage (23±5°C)         < 0.02% + 20mV  | •  | 311.7, 31.1.                   |                |  |
| Series Mode-Voltage  |  |                                | -              |  |
| Parallel Mode-Current   6A   N/A     Total Power   378W     Setting Resolution-Voltage   0.1mV   1mV     Setting Resolution-Current   0.1mA   1mA     Setting Resolution-Current   0.1mA   1mA     Setting Accuracy-Voltage (23±5°C)   <0.02% + 20mV   <0.03% + 10mV     Setting Accuracy-Voltage (23±5°C)   <0.05% + 5mA   <0.05% + 10mA     Setting Temperature Coefficient   30pmm/C     Readback Resolution-Voltage   0.1mV   1mV     Readback Resolution-Current   0.1mA   1mA     Readback Resolution-Current   0.1mA   1mA     Readback Accuracy-Voltage (23±5°C)   <0.02% + 20mV   <0.03% + 10mV     Readback Accuracy-Current (23±5°C)   <0.02% + 20mV   <0.05% + 10mA     Readback Temperature Coefficient   30pmm/C     Long-term Stability   ≤50pmm/1000h     Voltage Ripple Noise (20Hz ~ 20MHz)   ≤10mVp-p   ≤10mVp-p     Voltage Ripple Noise (20Hz ~ 20MHz)   ≤10mVp-p   ≤10mVp-p     Voltage Ripple Noise (20Hz ~ 20MHz)   51mVms     Current Ripple Noise (20Hz ~ 20MHz)   20ms   20ms     Voltage Ripple Time (no load) (10%-90% 5. Variation Time)   20ms   20ms     Voltage Rime Time (no load) (10%-90% 5. Variation Time)   45ms   13ms     Transient Recovery Time   ≤1ms     Line Regulation-Voltage   ≤0.01%+1mV   ≤0.01%+3mV     Line Regulation-Voltage   ≤0.01%+1mV   ≤0.01%+3mV     Line Regulation-Current   ≤0.01%+6mA   ≤0.02%+3mA     Load Regulation-Current   ≤0.01%+6mA   ≤0.02%+3mA     Load Regulation-Current   ≤0.01%+6mA   ≤0.02%+3mA     Load Regulation-Current   ≤0.01%+6mA   ≤0.02%+3mA     Load Regulation-Current   ≤0.01%+6mA   ≤0.01%+3mV     Line Regulation-Current   ≤0.01%+6mA   ≤0.02%+3mA     Load Regulation-Curre  |  |                                | -              |  |
| Total Power   378W   |  | -                              |                |  |
| Setting Resolution-Voltage   |  | -                              |                |  |
| Setting Resolution-Current   0.1mA   |  |                                |                |  |
| Setting Accuracy-Voltage (23±5°C)  |  | ¥111111                        |                |  |
| Setting   Accuracy-Current (23±5°C)   < 0.05% + 5mA   < 0.05% + 10mA   |  |                                | *****          |  |
| Setting Temperature Coefficient         30ppm/°C           Readback Resolution-Voltage         0.1mV         1mV           Readback Resolution-Current         0.1mA         1mA           Readback Accuracy-Voltage (23±5°C)         < 0.02% + 20mV   |  |                                |                |  |
| Readback Resolution-Voltage         0.1mV         1mV           Readback Resolution-Current         0.1mA         1mA           Readback Accuracy-Voltage (23±5°C)         <0.02% + 20mV   |  |                                |                |  |
| Readback Resolution-Current   0.1mA  |  |                                | m/°C           |  |
| Readback Accuracy-Voltage (23±5°C)   |  | 0.1mV                          | 1mV            |  |
| Readback Accuracy-Current (23±5°C)   |  | 0.1mA                          | 1mA            |  |
| Readback Temperature Coefficient   30ppm/°C   Long-term Stability   ≤50ppm/1000h   ≤10mVp-p   ≤   | Readback Accuracy-Voltage (23±5°C)                         | < 0.02% + 20mV                 | < 0.03% + 10mV |  |
| Long-term Stability  | Readback Accuracy-Current (23±5°C)                         | < 0.05% + 5mA                  | < 0.05% + 10mA |  |
| Voltage Ripple Noise (20Hz ~ 20MHz)  | Readback Temperature Coefficient                           | 30pp                           | m/℃            |  |
| Voltage Ripple Noise (20Hz ~ 20MHz)         ≤1mVrms           Current Ripple Noise (20Hz ~ 20MHz)         SamArms           Dynamic Characteristics           Voltage Rise Time (no load) (10%-90%F.S. Variation Time)         20ms         20ms           Voltage Rise Time (no load) (10%-90%F.S. Variation Time)         50ms         21ms           Voltage Filal Time (no load) (30%-10%F.S. Variation Time)         800ms         200ms           Voltage Filal Time (full load) (90%-10%F.S. Variation Time)         45ms         13ms           Transient Recovery Time         ≤1ms           Line Regulation-Voltage         ≤0.01%+1mV         ≤0.01%+3mV           Line Regulation-Current         ≤0.01%+3mA         ≤0.02%+3mA           Load Regulation-Voltage         ≤0.01%+3mA         ≤0.02%+3mA           Load Regulation-Current         ≤0.01%+6mA         ≤0.02%+3mA           Voltage Range         ±600V ±60V ±6V           Measurement Resolution         5½ digits           Measurement Resolution         5½ digits           Measurement Frequency         4Hz           Imput Impedance         10MΩ           Terminal         Pluggable terminal           Temperature Coefficient (0~40°C)         20ppm/°C           Others           Isola  | Long-term Stability  | ≤50ppm/1000h                   |                |  |
| Samarms   Dynamic Characteristics  | Voltage Ripple Noise (20Hz ~ 20MHz)                        | ≤10mVp-p                       | ≤10mVp-p       |  |
| Dynamic Characteristics  | Voltage Ripple Noise (20Hz ~ 20MHz)                        |                                |                |  |
| Dynamic Characteristics  | Current Ripple Noise (20Hz ~ 20MHz)                        | ≤3m <i>A</i>                   | Arms           |  |
| Voltage Rise Time (full load) (10%-90%F.S. Variation Time)   S0ms   21ms   |  | Dynamic Characteristics        |                |  |
| Voltage Rise Time (full load) (10%-90%F.S. Variation Time)         50ms         21ms           Voltage Fall Time (no load) (90%-10%F.S. Variation Time)         800ms         200ms           Voltage Fall Time (no load) (90%-10%F.S. Variation Time)         45ms         13ms           Transient Recovery Time         ≤1ms           Line Regulation-Voltage         ≤0.01%+1mV         ≤0.01%+3mV           Line Regulation-Current         ≤0.01%+3mA         ≤0.02%+3mA           Load Regulation-Voltage         ≤0.01%+6mA         ≤0.02%+3mA           Load Regulation-Current         ≤0.01%+6mA         ≤0.02%+3mA           Voltage Range         ±600V±60V         €0.00%+3mA           Voltage Range         ±600V±60V/±6V         Weasurement Resolution         5½ digits           Measurement Resolution         5½ digits         €0.01% ±0.01%F.S.           Measurement Frequency         4Hz         Englander           Input Impedance         10MΩ         Errminal           Temperature Coefficient (0~40°C)         20pm/°C         Oppm/°C           Others         Solation (Output to Ground)         500V DC           Communication Response Time Interface         LAN/RS232           AC Input         Single phase, 220V AC±10%, frequency 47Hz~63Hz           Iemperature         Operating   | Voltage Rise Time (no load) (10%-90%F.S. Variation Time)   | 20ms                           | 20ms           |  |
| Voltage Fall Time (no load) (90%-10%F.S. Variation Time)         800ms         200ms           Voltage Fall Time (full load) (90%-10%F.S. Variation Time)         45ms         13ms           Transient Recovery Time         ≤1ms           Line Regulation-Voltage         ≤0.01%+1mV         ≤0.01%+3mV           Line Regulation-Current         ≤0.01%+3mA         ≤0.02%+3mA           Load Regulation-Voltage         ≤0.01%+6mA         ≤0.02%+3mA           Load Regulation-Current         ≤0.01%+6mA         ≤0.02%+3mA           DVM Measurement (For N3413P Only)           Channels           Voltage Range           Measurement Resolution           Measurement Recolution           Measurement Frequency           Imput Impedance         10MΩ           Terminal         Pluggable terminal           Temperature Coefficient (0~40°C)         20pm/°C           Others           Solation (Output to Ground)           Soms           Interface         LAN/RS232           AC Input         Single phase, 220V AC±10%, frequency 47Hz~63Hz           Temperature         Operating temperature: 0°C~40°C, storage temperature: -20°C~60°C           Operating Environment   | Voltage Rise Time (full load) (10%-90%F.S. Variation Time) | 50ms                           |                |  |
| Voltage Fall Time (full load) (90%-10%F.S. Variation Time)         45ms         13ms           Transient Recovery Time         ≤1ms           Line Regulation-Voltage         ≤0.01%+1mV         ≤0.01%+3mV           Line Regulation-Current         ≤0.01%+3mA         ≤0.02%+3mA           Load Regulation-Current         ≤0.01%+6mA         ≤0.02%+3mA           DVM Measurement (For N3413P Only)           Channels         1CH           Voltage Range         ±600V/±60V/±6V           Measurement Resolution         5½ digits           Measurement Accuracy         0.01% + 0.01%F.S.           Measurement Frequency         4Hz           Input Impedance         10MΩ           Terminal         Pluggable terminal           Terminal         Pluggable terminal           Temperature Coefficient (0~40°C)         20ppm/°C           Others           Isolation (Output to Ground)         500V DC           Communication Response Time         ≤5ms           Interface         LAN/RS232           AC Input         Single phase, 220V AC±10%, frequency 47Hz~63Hz           Temperature         Operating temperature: 0°C~40°C, storage temperature: -20°C~60°C   | Voltage Fall Time (no load) (90%-10%F.S. Variation Time)   | 800ms                          | 200ms          |  |
| Transient Recovery Time  Line Regulation-Voltage  Line Regulation-Current  Solo1%+3mA  Solo2%+3mA  S | Voltage Fall Time (full load) (90%-10%F.S. Variation Time) | 45ms                           |                |  |
| Line Regulation-Voltage         ≤0.01%+1mV         ≤0.01%+3mV           Line Regulation-Current         ≤0.01%+3mA         ≤0.02%+3mA           Load Regulation-Current         ≤0.01%+6mA         ≤0.02%+3mA           DVM Measurement (For N3413P Only)           Channels         1CH           Voltage Range         ±600V/±60V/±6V           Measurement Resolution         5½ digits           Measurement Frequency         4Hz           Input Impedance         10MΩ           Terminal         Pluggable terminal           Temperature Coefficient (0~40°C)         20ppm/°C           Others           Isolation (Output to Ground)         500V DC           Communication Response Time         ≤5ms           Interface         LAN/RS232           AC Input         Single phase, 220V AC±10%, frequency 47Hz~63Hz           Temperature         Operating temperature: 0°C~40°C, storage temperature: -20°C~60°C           Operating Environment         Altitude <2000m, relative humidity: 5%~90%RH(non-condensing), atmospheric pressure: 80~110kPa  | Transient Recovery Time                                    | ≤1n                            | ns             |  |
| Load Regulation-Voltage  Load Regulation-Current  So.01%+6mA  So.02%+3mA  DVM Measurement (For N3413P Only)  Channels  1CH  Voltage Range  ±600V/±60V/±6V  Measurement Resolution  Measurement Accuracy  Measurement Frequency  Input Impedance  Terminal  Temperature Coefficient (0~40°C)  Communication Response Time  Interface  AC Input  Single phase, 220V AC±10%, frequency 47Hz~63Hz  Temperature Coefficient  Operating temperature: 0°C~40°C, storage temperature: 20°C~60°C  Operating Environment  Attitude <2000m, relative humidity: 5%+90%RH(non-condensing), atmospheric pressure: 80~110kPa  Net Weight  | Line Regulation-Voltage                                    | ≤0.01%+1mV                     | ≤0.01%+3mV     |  |
| Load Regulation-Current       ≤0.01%+6mA       ≤0.02%+3mA         DVM Measurement (For N3413P Only)         Channels       1CH         Voltage Range       ±600V/±60V/±6V         Measurement Resolution       5½ digits         Measurement Accuracy       0.01% + 0.01%F.S.         Measurement Frequency       4Hz         Input Impedance       10MΩ         Terminal       Pluggable terminal         Temperature Coefficient (0~40°C)       20ppm/°C         Others         Isolation (Output to Ground)         Communication Response Time       ≤5ms         Interface       LAN/RS232         AC Input       Single phase, 220V AC±10%, frequency 47Hz~63Hz         Temperature       Operating temperature: 0°C~40°C, storage temperature: -20°C~60°C         Operating Environment       Altitude <2000m, relative humidity: 5%-90%RH(non-condensing), atmospheric pressure: 80~110kPa   | Line Regulation-Current                                    | ≤0.01%+3mA                     | ≤0.02%+3mA     |  |
| DVM Measurement (For N3413P Only)  Channels  1CH  Voltage Range  ±600V/±60V/±6V  Measurement Resolution  5½ digits  Measurement Accuracy  0.01% + 0.01%F.S.  Measurement Frequency Input Impedance  10MΩ  Terminal  Temperature Coefficient (0~40°C)  Others  Isolation (Output to Ground)  Communication Response Time Interface  LAN/RS232  AC Input  Single phase, 220V AC±10%, frequency 47Hz~63Hz  Operating Environment  Altitude <2000m, relative humidity: 5%~90%RH(non-condensing), atmospheric pressure: 80~110kPa  Net Weight   |  | ≤0.01%                         | %+3mV          |  |
| Channels       1CH         Voltage Range       ±600V/±60V/±6V         Measurement Resolution       5½ digits         Measurement Accuracy       0.01% + 0.01%F.S.         Measurement Frequency       4Hz         Input Impedance       10MΩ         Terminal       Pluggable terminal         Temperature Coefficient (0~40°C)       20ppm/°C         Others         Isolation (Output to Ground)       500V DC         Communication Response Time       ≤5ms         Interface       LAN/RS232         AC Input       Single phase, 220V AC±10%, frequency 47Hz~63Hz         Temperature       Operating temperature: 0°C~40°C, storage temperature: -20°C~60°C         Operating Environment       Attitude <2000m, relative humidity: 5%~90%RH(non-condensing), atmospheric pressure: 80~110kPa   | Load Regulation-Current                                    | ≤0.01%+6mA                     | ≤0.02%+3mA     |  |
| Voltage Range  Measurement Resolution  Measurement Accuracy  Measurement Frequency  Measurement Accuracy  Measurement Resolution  Measurement Resolution  Measurement Resolution  Measurement Accuracy  Measurement Accuracy  Measurement Accuracy  Measurement Accuracy  Measurement Accuracy  Measurement Accuracy  Measurement Frequency  Measurement Accuracy  Measurement Accuracy  Measurement Frequency  Measurement Accuracy  Measurement Resolution  Measurement Accuracy  Mea | DV   | M Measurement (For N3413P Only | ·)             |  |
| Measurement Resolution       5½ digits         Measurement Accuracy       0.01% + 0.01%F.S.         Measurement Frequency       4Hz         Input Impedance       10MΩ         Terminal       Pluggable terminal         Temperature Coefficient (0~40°C)       20ppm/°C         Others         Isolation (Output to Ground)       500V DC         Communication Response Time       ≤5ms         Interface       LAN/RS232         AC Input       Single phase, 220V AC±10%, frequency 47Hz~63Hz         Temperature       Operating temperature: 0°C~40°C, storage temperature: -20°C~60°C         Operating Environment       Altitude <2000m, relative humidity: 5%~90%RH(non-condensing), atmospheric pressure: 80~110kPa   | Channels   | 1CH                            |                |  |
| Measurement Accuracy  Measurement Frequency  Measurement Frequency |  |                                |                |  |
| Measurement Frequency       4Hz         Input Impedance       10MΩ         Terminal       Pluggable terminal         Temperature Coefficient (0~40°C)       20ppm/°C         Others         Isolation (Output to Ground)       500V DC         Communication Response Time       ≤5ms         Interface       LAN/RS232         AC Input       Single phase, 220V AC±10%, frequency 47Hz~63Hz         Temperature       Operating temperature: 0°C~40°C, storage temperature: -20°C~60°C         Operating Environment       Altitude <2000m, relative humidity: 5%~90%RH(non-condensing), atmospheric pressure: 80~110kPa   |  | ·                              |                |  |
| Input Impedance Terminal Temperature Coefficient (0~40°C)  Others  Solation (Output to Ground) Communication Response Time Interface AC Input Temperature Single phase, 220V AC±10%, frequency 47Hz~63Hz Temperature Operating Environment  Altitude <2000m, relative humidity: 5%~90%RH(non-condensing), atmospheric pressure: 80~110kPa  Approx. 11kg  |  |                                |                |  |
| Terminal Temperature Coefficient (0~40°C)  Others    Solution (Output to Ground)   500V DC   |  |                                |                |  |
| Temperature Coefficient (0~40°C)  Others  Isolation (Output to Ground)  Communication Response Time  Interface  AC Input  Temperature  Operating Environment  Altitude <2000m, relative humidity: 5%~90%RH(non-condensing), atmospheric pressure: 80~110kPa  Net Weight  Others  20ppm/°C  Others  Single phase, 200V DC  Single phase, 220V AC±10%, frequency 47Hz~63Hz  Operating temperature: 0°C~40°C, storage temperature: -20°C~60°C  Altitude <2000m, relative humidity: 5%~90%RH(non-condensing), atmospheric pressure: 80~110kPa  Approx. 11kg  |  |                                |                |  |
| Others  Isolation (Output to Ground)  Communication Response Time  ≤5ms  Interface  LAN/RS232  AC Input  Single phase, 220V AC±10%, frequency 47Hz~63Hz  Temperature  Operating temperature: 0°C~40°C, storage temperature: -20°C~60°C  Operating Environment  Altitude <2000m, relative humidity: 5%~90%RH(non-condensing), atmospheric pressure: 80~110kPa  Net Weight  Approx. 11kg   |  |                                |                |  |
| Solation (Output to Ground)  Communication Response Time  ≤5ms Interface  LAN/RS232  AC Input  Single phase, 220V AC±10%, frequency 47Hz~63Hz  Temperature  Operating temperature: 0°C~40°C, storage temperature: -20°C~60°C  Operating Environment  Altitude <2000m, relative humidity: 5%~90%RH(non-condensing), atmospheric pressure: 80~110kPa  Net Weight  Approx. 11kg   |  |                                |                |  |
| Communication Response Time       ≤5ms         Interface       LAN/RS232         AC Input       Single phase, 220V AC±10%, frequency 47Hz~63Hz         Temperature       Operating temperature: 0°C~40°C, storage temperature: -20°C~60°C         Operating Environment       Altitude <2000m, relative humidity: 5%~90%RH(non-condensing), atmospheric pressure: 80~110kPa  | Isolation (Output to Ground)                               |                                | / DC           |  |
| Interface  LAN/RS232  AC Input  Single phase, 220V AC±10%, frequency 47Hz~63Hz  Temperature  Operating temperature: 0°C~40°C, storage temperature: -20°C~60°C  Operating Environment  Altitude <2000m, relative humidity: 5%~90%RH(non-condensing), atmospheric pressure: 80~110kPa  Net Weight  Approx. 11kg  | , ,  |                                |                |  |
| AC Input  Single phase, 220V AC±10%, frequency 47Hz~63Hz  Temperature  Operating temperature: 0°C~40°C, storage temperature: -20°C~60°C  Operating Environment  Altitude <2000m, relative humidity: 5%~90%RH(non-condensing), atmospheric pressure: 80~110kPa  Net Weight  Approx. 11kg  | Interface  |                                |                |  |
| Temperature Operating temperature: 0°C~40°C, storage temperature: -20°C~60°C  Operating Environment Altitude <2000m, relative humidity: 5%~90%RH(non-condensing), atmospheric pressure: 80~110kPa  Net Weight Approx. 11kg   |  |                                |                |  |
| Operating Environment  Altitude <2000m, relative humidity: 5%~90%RH(non-condensing), atmospheric pressure: 80~110kPa  Net Weight  Approx. 11kg   | Temperature  | * '                            |                |  |
| Net Weight Approx. 11kg  | Operating Environment                                      |                                |                |  |
|  | Net Weight   |                                |                |  |
|  | Dimension  |                                |                |  |

Note 1: For other specifications, please contact NGI.

Note 2: All specifications are subject to change without notice.



# **Technical Data Sheet (3)**

| Model  | N3411E  |                 | N3412E                 |                |
|--|---|-----------------|------------------------|----------------|
| Channel  | CH1/CH2   | CH3             | CH1/CH2                | CH3            |
| Voltage  | 32V   | 6V              | 32V                    | 6V             |
| Current  | 3A  | 3A              | 5A                     | 3A             |
| Series Mode-Voltage  | 64V   | N/A             | 64V                    | N/A            |
| Parallel Mode-Current                                      | 6A  | N/A             | 10A                    | N/A            |
| Total Power  | 21  | 0W              | 338W                   |                |
| Setting Resolution-Voltage                                 | 10mV  | 1mV             | 10mV                   | 1mV            |
| Setting Resolution-Current                                 |   | 1r              | nA                     |                |
| Setting Accuracy-Voltage (23±5°C)                          | < 0.01% + 20mV  | < 0.03% + 10mV  | < 0.01% + 20mV         | < 0.03% + 10mV |
| Setting Accuracy-Current (23±5°C)                          | < 0.05%   | + 10mA          | < 0.05% + 20mA         | < 0.05% + 10mA |
| Setting Temperature Coefficient                            |   | 50pp            | m/℃                    |                |
| Readback Resolution-Voltage                                | 10mV  | 1mV             | 10mV                   | 1mV            |
| Readback Resolution-Current                                |   | 1n              | nA                     |                |
| Readback Accuracy-Voltage (23±5°C)                         | < 0.01% + 20mV  | < 0.03% + 10mV  | < 0.01% + 20mV         | < 0.03% + 10mV |
| Readback Accuracy-Current (23±5°C)                         | < 0.05%   | 6 + 10mA        | < 0.05% + 20mA         | < 0.05% + 10mA |
| Readback Temperature Coefficient                           | 50ppm/℃   |                 |                        |                |
| Long-term Stability  | ≤50ppm/1000h  |                 |                        |                |
| Voltage Ripple Noise (20Hz ~ 20MHz)                        | ≤5mVp-p   | ≤10mVp-p        | ≤5mVp-p                | ≤10mVp-p       |
| Voltage Ripple Noise (20Hz ~ 20MHz)                        | ≤1mVrms   |                 |                        |                |
| Current Ripple Noise (20Hz ~ 20MHz)                        | ≤3mArms   |                 |                        |                |
|  | Dynamic Cha   | aracteristics   |                        |                |
| Voltage Rise Time (no load) (10%-90%F.S. Variation Time)   | 20ms  | 20ms            | 20ms                   | 20ms           |
| Voltage Rise Time (full load) (10%-90%F.S. Variation Time) | 50ms  | 21ms            | 50ms                   | 21ms           |
| Voltage Fall Time (no load) (90%-10%F.S. Variation Time)   | 400ms   | 200ms           | 400ms                  | 200ms          |
| Voltage Fall Time (full load) (90%-10%F.S. Variation Time) | 45ms  | 13ms            | 45ms                   | 13ms           |
| Transient Recovery Time                                    | ≤1ms  |                 |                        |                |
| Line Regulation-Voltage                                    | ≤0.01%+1mV  | ≤0.01%+3mV      | ≤0.01%+1mV             | ≤0.01%+3mV     |
| Line Regulation-Current                                    | ≤0.01%+1mA  | ≤0.02%+3mA      | ≤0.01%+3mA             | ≤0.02%+3mA     |
| Load Regulation-Voltage                                    | ≤0.01%+3mV  |                 |                        |                |
| Load Regulation-Current                                    | ≤0.01%+3mA  | ≤0.02%+3mA      | ≤0.01%+3mA             | ≤0.02%+3mA     |
| Others   |   |                 |                        |                |
| Isolation (Output to Ground)                               | 500V DC   |                 |                        |                |
| Communication Response Time                                | ≤5ms  |                 |                        |                |
| Interface  | LAN/RS232   |                 |                        |                |
| AC Input   | Single phase, 220V AC±10%, frequency 47Hz~63Hz  |                 |                        |                |
| Temperature  | Operating temperature: 0°C~40°C, storage temperature: -20°C~60°C                              |                 |                        |                |
| Operating Environment                                      | Altitude <2000m, relative humidity: 5%~90%RH(non-condensing), atmospheric pressure: 80~110kPa |                 | ic pressure: 80~110kPa |                |
| Net Weight   | Approx. 9kg   |                 | Approx. 11kg           |                |
| Dimension  | 011 00 0/11/*044 (  | O(W)*413.0(D)mm | 2U, 88.0(H)*214.0      | (\A\)*44C O(D) |

Note 1: For other specifications, please contact NGI.

Note 2: All specifications are subject to change without notice.



## **Technical Data Sheet (4)**

| Model  | N3413E  |                |  |
|--|---|----------------|--|
| Channel  | CH1/CH2   | CH3            |  |
| Voltage  | 60V   | 6V             |  |
| Current  | 3A  | 3A             |  |
| Series Mode-Voltage  | 120V  | N/A            |  |
| Parallel Mode-Current                                      | 6A  | N/A            |  |
| Total Power  | 378W  |                |  |
| Setting Resolution-Voltage                                 | 10mV  | 1mV            |  |
| Setting Resolution-Current                                 | 1r  | mA             |  |
| Setting Accuracy-Voltage (23±5°C)                          | < 0.02% + 40mV  | < 0.03% + 10mV |  |
| Setting Accuracy-Current (23±5°C)                          | < 0.05%   | % + 10mA       |  |
| Setting Temperature Coefficient                            | 50ppm/°C  |                |  |
| Readback Resolution-Voltage                                | 10mV  | 1mV            |  |
| Readback Resolution-Current                                | 1m  | nA             |  |
| Readback Accuracy-Voltage (23±5°C)                         | < 0.02% + 40mV  | < 0.03% + 10mV |  |
| Readback Accuracy-Current (23±5°C)                         | < 0.05% + 10mA  |                |  |
| Readback Temperature Coefficient                           | 50ppm/℃   |                |  |
| Long-term Stability  | ≤50ppm/1000h  |                |  |
| Voltage Ripple Noise (20Hz ~ 20MHz)                        | ≤10mVp-p  | ≤10mVp-p       |  |
| Voltage Ripple Noise (20Hz~20MHz)                          | ≤1m   | Vrms           |  |
| Current Ripple Noise (20Hz ~ 20MHz)                        | ≤3mArms   |                |  |
|  | Dynamic Characteristics   |                |  |
| Voltage Rise Time (no load) (10%-90%F.S. Variation Time)   | 20ms  | 20ms           |  |
| Voltage Rise Time (full load) (10%-90%F.S. Variation Time) | 50ms  | 21ms           |  |
| Voltage Fall Time (no load) (90%-10%F.S. Variation Time)   | 800ms   | 200ms          |  |
| Voltage Fall Time (full load) (90%-10%F.S. Variation Time) | 45ms  | 13ms           |  |
| Transient Recovery Time                                    | ≤1ms  |                |  |
| Line Regulation-Voltage                                    | ≤0.01%+1mV  | ≤0.01%+3mV     |  |
| Line Regulation-Current                                    | ≤0.01%+3mA  | ≤0.02%+3mA     |  |
| Load Regulation-Voltage                                    | ≤0.01%+3mV  |                |  |
| Load Regulation-Current                                    | ≤0.01%+6mA  | ≤0.02%+3mA     |  |
|  | Others  |                |  |
| Isolation (Output to Ground)                               | 500V DC   |                |  |
| Communication Response Time                                | ≤5ms  |                |  |
| Interface  | LAN/RS232   |                |  |
| AC Input   | Single phase, 220V AC±10%, frequency 47Hz~63Hz  |                |  |
| Temperature  | Operating temperature: 0°C~40°C, storage temperature: -20°C~60°C                              |                |  |
| Operating Environment                                      | Altitude <2000m, relative humidity: 5%~90%RH(non-condensing), atmospheric pressure: 80~110kPa |                |  |
| Net Weight   | Approx. 11kg  |                |  |
| Dimension  | 2U, 88.0(H)*214.0(W)*446.0(D)mm   |                |  |

Note 1: For other specifications, please contact NGI.

Note 2: All specifications are subject to change without notice.