WIDEBAND CURRENT AMPLIFIER

SA-600 Series

SA-600 Series is a low noise wideband current amplifier (current to voltage converter) with a high gain. There are the following four types depending on the gain.
It operates stably for the added input capacitance despite a wide frequency band. It operates without oscillation with an added input capacitance of 1000 pF. The LPF cutoff frequency can be selected from four steps with a switch.

Model	SA-604F2	SA-605F2	SA-606F2	SA-607F2
Gain (V/A)	10 M	100 M	1 G	10 G
Frequency Resonse	DC to 500 kHz	DC to 250 kHz	DC to 100 kHz	DC to 20 kHz
Equivalent Input Noise Current Density	45 fA/√Hz (typ.)	15 fA/√Hz (typ.)	6 fA/√Hz (typ.)	2.5 fA/√Hz (typ.)

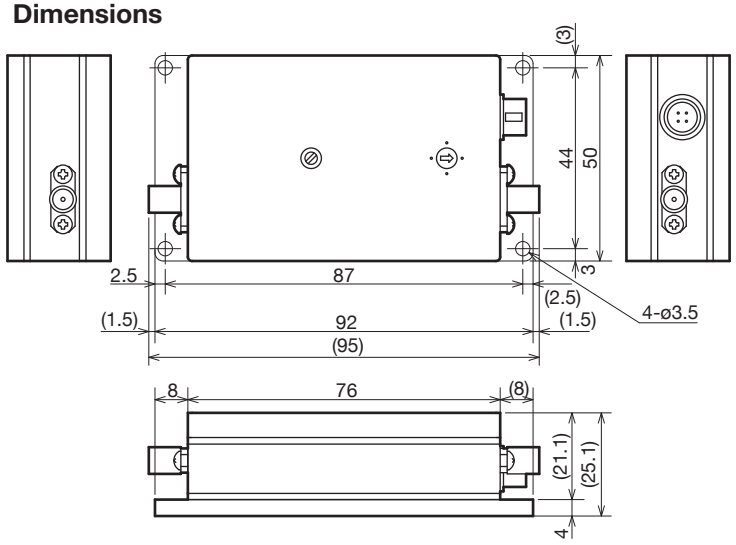
Maximum Absolute Rating: Power supply voltage (±Vs) ±18 V, Max. Input current ±30 mA, Max. input voltage at offset adjustment terminal ±Vs
Electrical Characteristics: Unless otherwise specified, power supply ±15 V, temperature 23°C ±5°C, and output load R_L=1 MΩ

Model		SA-604F2	SA-605F2	SA-606F2	SA-607F2
Input Section					
Input type		DC coupling unbalanced, single-ended input, SMA connector			
Maximum input current		±1 μA	±100 nA	±10 nA	±1 nA
Input impedance *1		1 kΩ	3 kΩ	10 kΩ	30 kΩ
Recommended signal source resistance		1 MΩ or more	10 MΩ or more	100 MΩ or more	1 GΩ or more
Input bias current *2		1 pA (typ.)			
Equivalent input noise current density *3		45 fA/√Hz (typ.)	15 fA/√Hz (typ.)	6 fA/√Hz (typ.)	2.5 fA/√Hz (typ.)
Output Section					
Output type		DC coupling unbalanced, single-ended output, SMA connector			
Maximum output voltage *1		±10 V			
Maximum output current *1		±5 mA			
Output impedance *1		50 Ω±10%			
Output offset voltage *4		±3 mV		±5 mV	±15 mV
Output offset voltage adjustment range		±15 mV (adjusting with a variable resistor)			±20 mV
Amplification Section					
Gain (V/A) *5		1×10^7 (10 M) ±1%	1×10^8 (100 M) ±1%	1×10^9 (1 G) ±1%	1×10^{10} (10 G) ±1%
Output gain flatness (when setting fc 0, within ±0.5 dB) *6 *7		DC to 50 kHz	DC to 25 kHz	DC to 10 kHz	DC to 2 kHz
$^{+0.5}_{-3}$dB Frequency response (Cs=10 pF) *8		DC to 500 kHz	DC to 250 kHz	DC to 100 kHz	DC to 20 kHz
Polarity		Non-inverting			
Low pass filter output (Cut-off frequency setting)		30 kHz / 100 kHz / 300 kHz / THRU, selctable with a switch	10 kHz / 30 kHz / 100 kHz / THRU, selctable with a switch	3 kHz / 10 kHz / 30 kHz / THRU, selctable with a switch	1 kHz / 3 kHz / 10 kHz / THRU, selctable with a switch
Others					
Power connector		HR10-7R-4P (73) connector			
Operating power supply voltage range		±15 V ±1 V			
Quiescent current		±40 mA or less, ±37 mA (typ.)		±40 mA or less, ±32 mA (typ.)	
Performance guarantee temperature range		23°C ±5°C			
Temperature and humidity range	Operation	0°C to 40°C 5 % to 85 % RH (absolute humidity 1 g/m³ to 25 g/m³, non-condensation)			
	Storage	-10°C to 50°C 5 % to 95 % RH (absolute humidity 1 g/m³ to 29 g/m³, non-condensation)			
RoHS		Directive 2011/65/EU			
EMC		EN 61326-1: 2015			
Dimensions (mm)		76 (W) × 50 (D) × 21.1 (H) (not including bottom plate and protrusions)			
Weight		Approx. 135 g			

*1 Nominal values when f = 1 kHz, when f = 100 Hz for SA-607F2 *2 The input bias current approximately doubles as the temperature increases by +7 °C *3 Measured with a Keysight 89410A equivalent when f = 1 kHz, when f = 100 Hz for SA-607F2 *4 Input is opened. *5 Measured with DC *6 When the cut-off frequency is set at THRU.
*7 Reference frequency: f = 10 Hz , f = 1 Hz for SA-607F2 *8 "Cs" is an added input capacitance between input and GND.

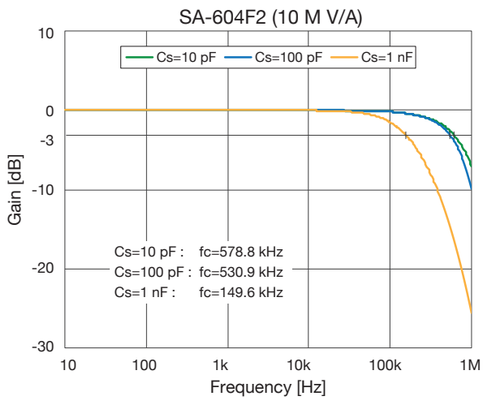
Accessories: Introduction manual (1), SMA open plug (1), BNC-SMA conversion connecter (2) ( ) represents the number of accessories.

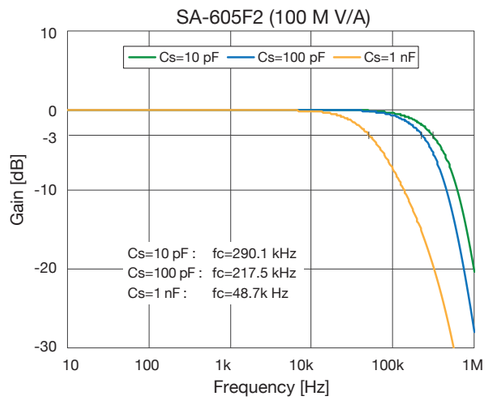
Dimensions

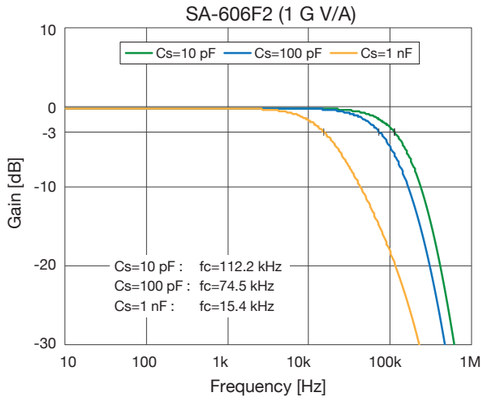


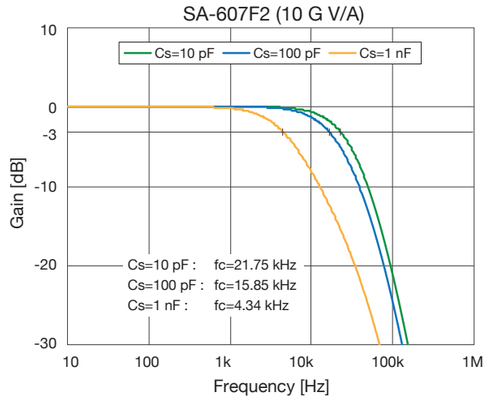
Characteristics

Frequency Response

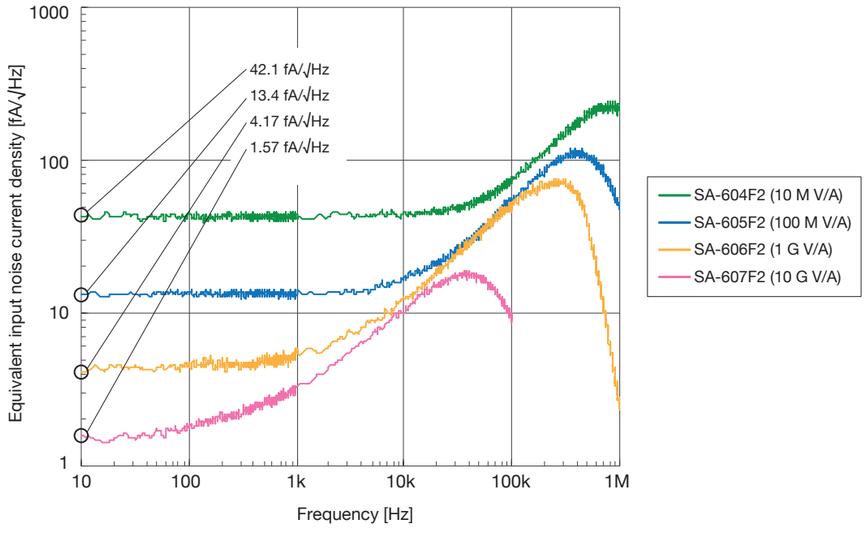






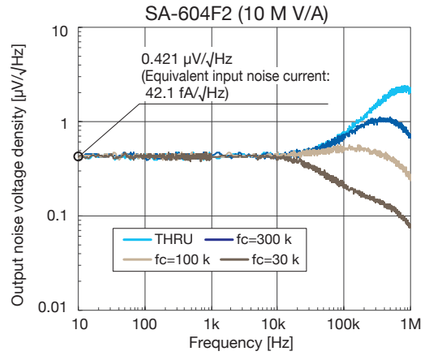


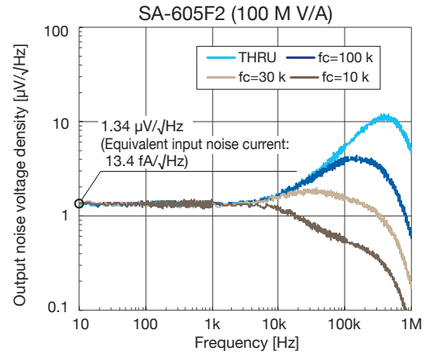
Equivalent Input Noise Current Density

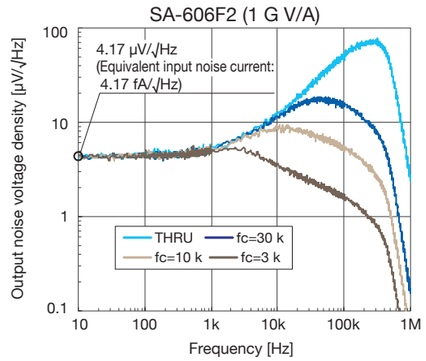


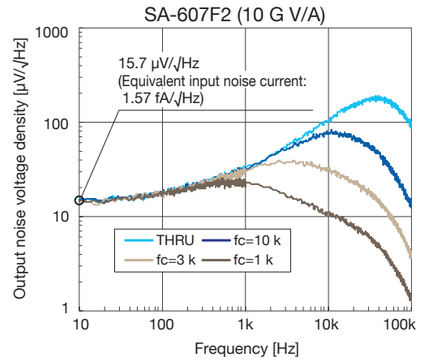
Output Noise Voltage Density

Equivalent input noise current

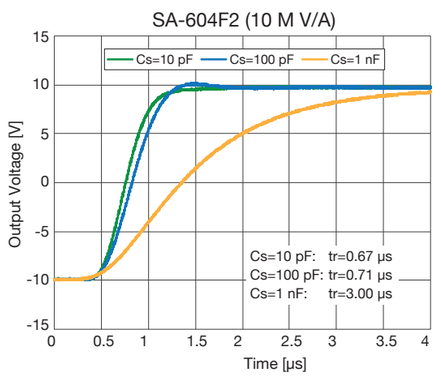


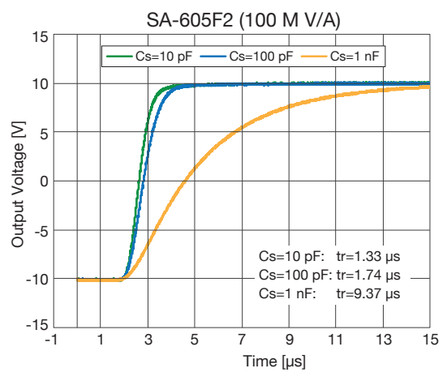


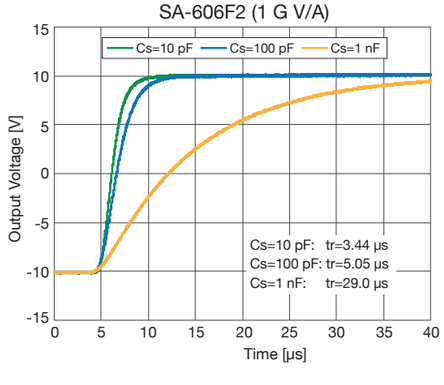


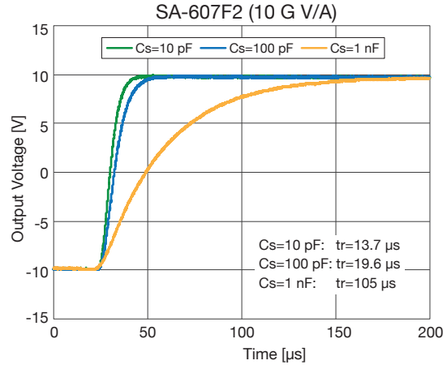


Pulse Response Characteristics









Recommended Product

LOW NOISE DC POWER SUPPLY

The LP Series “Low Noise DC Power Supply” maximizes the performance capabilities of our SA-600 Series.

LP5394

- Ultra Low Noise: 10 µVrms or lower (typ.) (10 Hz to 20 MHz bandwidth)
- Low Drift: Output Voltage Stability: ±10 ppm/°C (typ.)
- Output Voltage: 0 to ±15 V
- Output Current: 0.1 A max.
- Voltage Setting Range: 3 V, 5 V, 10 V or 15 V F.S.
- Finely adjusts the output voltage using the 10-turn potentiometer
- AC Input : 100 V/120 V/220 V/240 V ±10%
- 1/4-rack size

LP5393

- Ultra Low Noise: 10 µVrms or lower (typ.) (10 Hz to 20 MHz bandwidth)
- Output Voltage Stability: ±20 ppm/°C (typ.)
- Output Voltage: ±12 V to ±15 V
- Output Current: 0.1 A max.
- AC Input : 100 V/120 V/220 V/240 V ±10%
- 1/4-rack size

Options for LP Series

Output Conversion Adapter

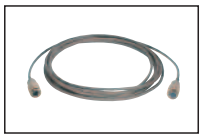
PA-001-2590
BNC Adapter
Converts output to BNC output for LP series

Output Cable A is required for the connection with this main unit

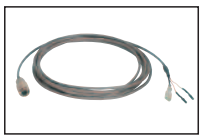
PA-001-2591
Binding Post Adapter
Converts output to binding post output for LP series

Output Cable A is required for the connection with this main unit

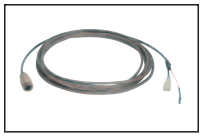
Output Cable



PA-001-2372
Output Cable A
for SA-600 series, PA-001-2590 and PA-001-2591
(Cable length: 2 m)



PA-001-2373
Output Cable B
for SA-200 series (except for SA-230F5) and SA-400 series
(Cable length: 2 m)



PA-001-2374
Output Cable C
for SA-230F5
(Cable length: 2 m)

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