

The C7706 is a high-speed logarithmic amplifier capable of amplifying the DC output current from a photomultiplier tube.

The output signal appears as a change of 2V when the input signal changes by one order of magnitude. The C7706 provides an output voltage that ranges from -8V to +4V corresponding to an input signal from 0.1nA to 100 μA. This conversion performance is ideal for applications where a wide range of input signal should be amplified at a high gain.

FEATURES

- Input Current Wide Dynamic Range
- Fast Time Response
- High Cost Performance

MAXIMUM RATINGS (Absolute Maximum Values)

Parameter	Description/Value
Supply Voltage	±18 Vdc
Input Current	0 to -1 mA
Operating Temperature	0 to +40 °C
Storage Temperature	-20 to +60 °C

CHARACTERISTICS (at 25°C)

Parameter		Description/Value	
Input Current		-0.1 nA to -100 μA ^(A)	
Input Impedance		1 kΩ	
Output Voltage	at 1 MΩ load resistor	-8 to +4 V	
	at 50 Ω load resistor	-3.7 to +2 V	
Output Impedance		50 Ω	
Current to Voltage Conversion Factor		$V = 0.8686 \ln(I_{in})$ ^(B)	
Temperature Coefficient (Error of fullscale)		0.02 %/°C Typ. ^(C)	
Step Response Time	Increase	-10 μA to -100 μA	1.1 μs
		-1 μA to -10 μA	1.3 μs
		-100 nA to -1 μA	2.4 μs
		-10 nA to -100 nA	18 μs
		-1 nA to -10 nA	170 μs
	Decrease	-100 μA to -10 μA	1.8 μs
		-10 μA to -1 μA	2.2 μs
		-1 μA to -100 nA	7.2 μs
		-100 nA to -10 nA	84 μs
		-10 nA to -1 nA	780 μs
Supply Voltage		±15 ±0.5 Vdc	
Supply Current ^(D) (at 50 Ω load resistor)	+15 V	18 mA	
	-15 V	64 mA	
Weight		Approx. 180 g	

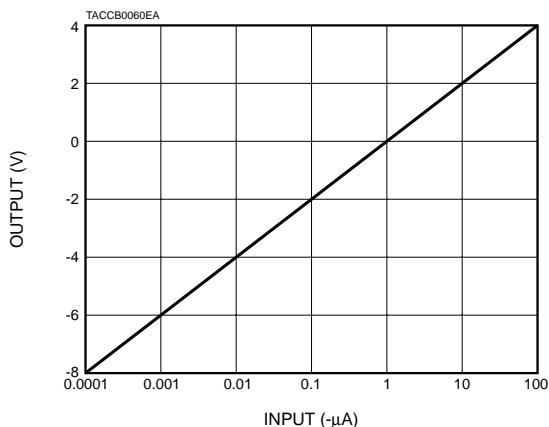
NOTE: (A): Less than -0.2 nA input limits output at 50 Ω load resistor terminated.

(B): Output voltage = 0 V at 1 μA input V: Output voltage (V) at 10 MΩ load resistor, I_{in}: Input current (-μA)

(C): Input current: 100 μA, Ambient temperature range: 0 to +40 °C

(D): Input: no connection, Output: 50 Ω load resistor terminated

Figure 1: Input Current vs. Output Voltage



Output Voltage Accuracy (Error of fullscale)

Input Current	Output Voltage	Accuracy	
		Typical	Maximum
-100 μA	4 V	±0.3 %	±0.6 %
-10 μA	2 V	±0.3 %	±0.6 %
-1 μA	0 V	±0.3 %	±0.6 %
-100 nA	-2 V	±0.3 %	±0.6 %
-10 nA	-4 V	±0.5 %	±1 %
-1 nA	-6 V	±1 %	±2 %
-100 pA	-8 V	±1 %	±2 %

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LOG AMPLIFIER UNIT C7706

Figure 2: Output Waveform

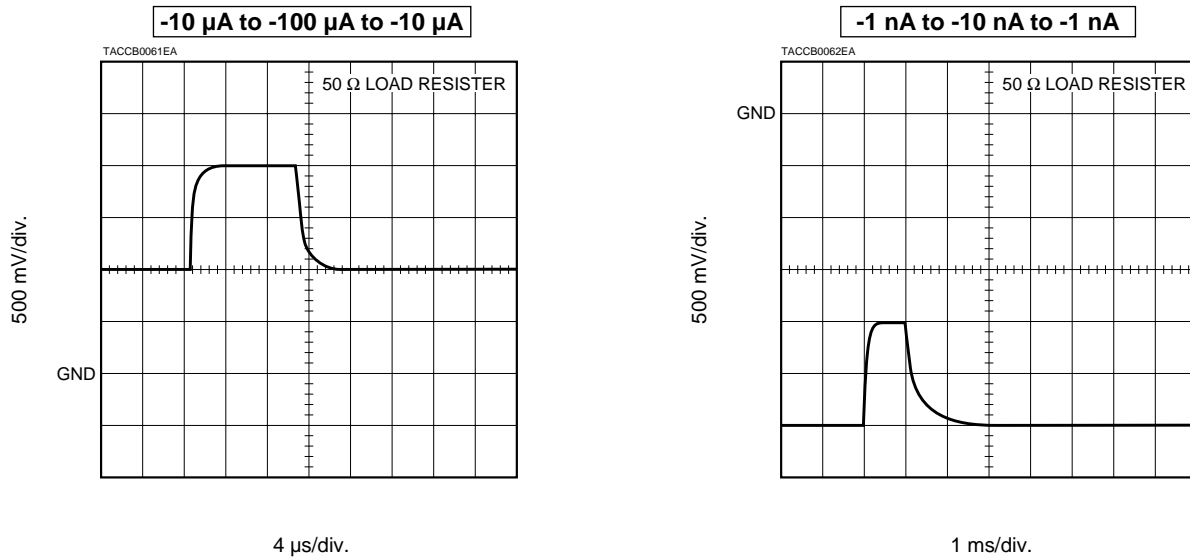
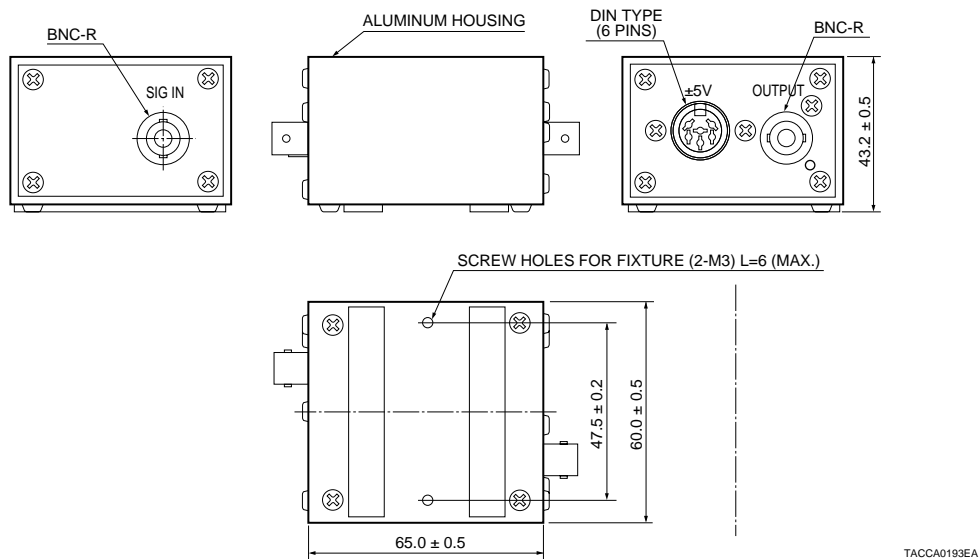
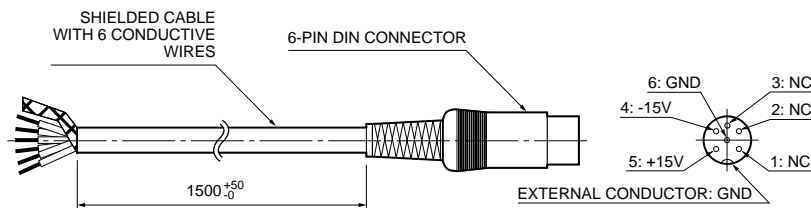


Figure 3: Dimensional Outline (Unit: mm)



Power Supply Cable (Supplied)



COUNNECTOR PIN	WIRE COLOR	CONNEX-TION
1	Red	NC
2	White	NC
3	Yellow	NC
4	Blue	-15V
5	Green	+15V
6	Black	GND
External Conductor	Shield	GND

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