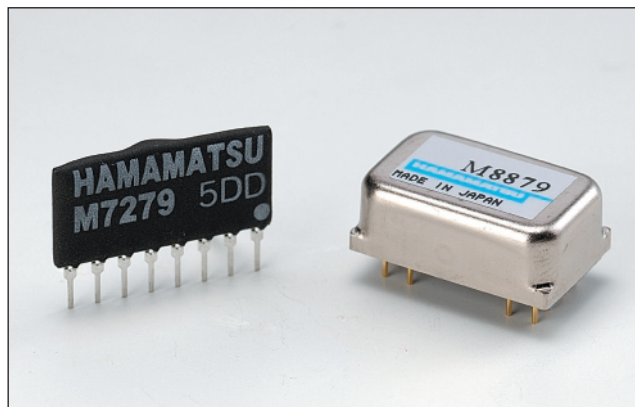


The M7279 and M8879 are non-inverting amplifier modules, specifically designed for photodetectors such as photomultiplier tubes. These amplifier modules work with either a current or voltage input, allowing direct connection to a photomultiplier tube or other photodetectors. The M7279 is comprised of an 8-pin SIP (single inline package) type hybrid IC with protective epoxy resin and the M8879 is a 10-pin hybrid IC to allow a compact mounting size on PC board. The offset voltage and gain are easily adjusted by connecting an external variable resistor.



### FEATURES

- Non-inverting Amplifier Modules
- Frequency Bandwidth
  - M7279: DC to 10 MHz
  - M8879: DC to 150 MHz
- Compact Size
- Current-to-Voltage Conversion Factor
  - M7279: 10 mV/μA
  - M8879: 4 mV/μA

### SPECIFICATIONS

#### MAXIMUM RATINGS (Absolute Maximum Values)

Parameter	M7279	M8879	Unit
Power Supply Voltage ( $\pm V_s$ )	$\pm 7$	$\pm 6.5$	V
Operating Temperature Range	-20 to +55	0 to +40	°C
Storage Temperature Range	-30 to +85	-15 to +60	°C
Signal Input Voltage	$\pm V_s$		V
Lead Soldering Temperature (Less than 5 s)	+280		°C

#### CHARACTERISTICS (at 25 °C, $\pm V_s = \pm 5$ V)

Parameter	M7279	M8879	Unit	
Voltage Gain	Load Resistance: 50 $\Omega$	100	80	—
Frequency Bandwidth (-3 dB)	See Figure 1, 2	DC to 10	DC to 150	MHz
Current-to-Voltage Conversion Factor	Load Resistance: 50 $\Omega$	10	4	mV/μA
Input Polarity	Positive / Negative		—	
Amplifying Method	Non-inverting Output		—	
Input Impedance	100	50	$\Omega$	
Output Impedance	50		$\Omega$	
Maximum Output Voltage	Load Resistance: 50 $\Omega$	Min.	$\pm 1.5$	V
	Load Resistance: 1 M $\Omega$	Min.	$\pm 3.5$	V
Output Noise Voltage	Load Resistance: 50 $\Omega$	Typ.	1.0	mVrms
Temperature Coefficient of Output Offset Voltage	Operating Temperature Range Load Resistance: 50 $\Omega$	$\pm 0.3$	$\pm 0.2$	mV/°C
Power Supply Voltage	Recommended Supply Voltage	$\pm 5$ to $\pm 6.5$	$\pm 5$ to $\pm 6$	V
Power Supply Current	Max.	45	61	mA
Weight		1.1	2.5	g

# AMPLIFIER MODULES M7279, M8879

## ● Typical Frequency Response

Figure 1: M7279

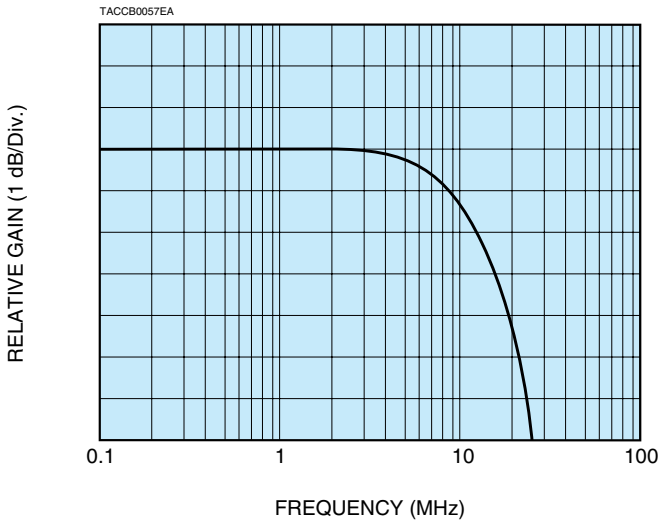
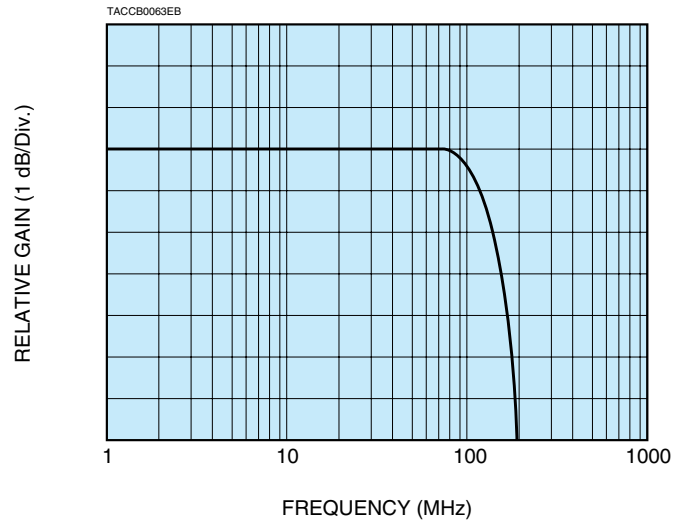
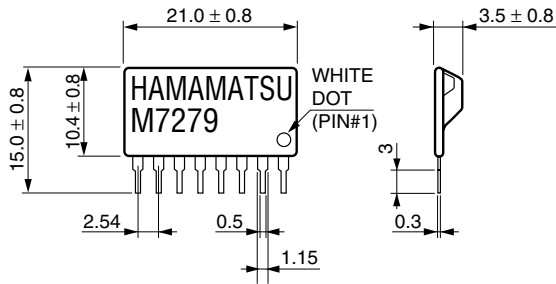


Figure 2: M8879



## ● Dimensional Outline and Pin Configuration (Unit: mm)

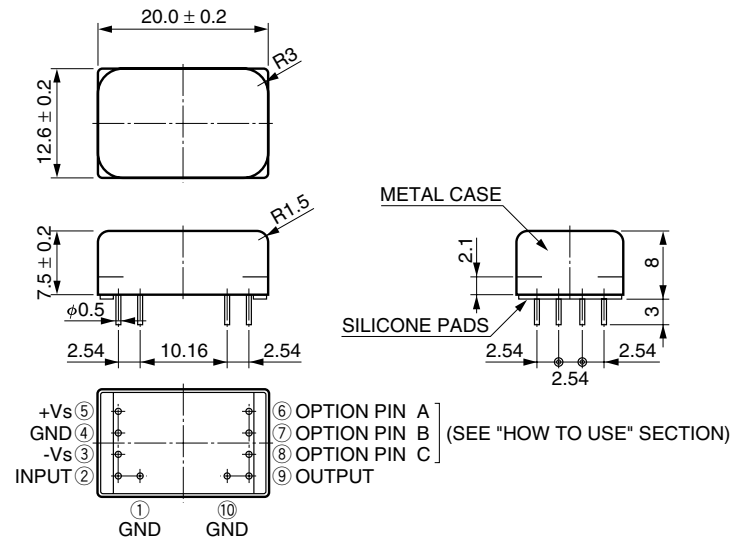
Figure 3: M7279



PIN#	FUNCTION
1	INPUT
2	-Vs
3	INTERNAL CONNECTION (DO NOT USE)
4	OPTION (SEE "HOW TO USE" SECTION)
5	GND
6	OUTPUT
7	+Vs
8	

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Figure 4: M8879



○ White dot mark is located on the character printed side to show the orientation of pin#1.

TACCA0248EA

## HOW TO USE

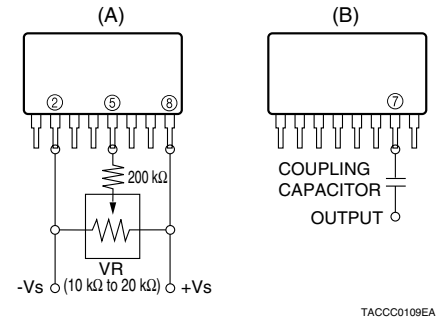
### ●M7279

#### To adjust the offset voltage:

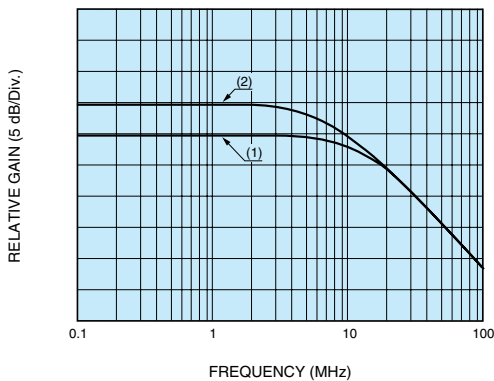
The DC offset voltage level varies with the ambient temperature and the internal impedance of the signal lines. To adjust this offset voltage level, externally connect a variable resistor across the option lead pins as shown in figure (A) on the right. If a capacitor is connected to pin 7 as shown in figure (B) on the right, this acts as AC coupling and eliminates the offset voltage.

#### To adjust the gain:

To adjust the gain of the M7279, externally connect a resistor ( $R_e$ ) across pins 5 and 6 as shown in the figure below. Use a resistor of  $150\ \Omega$  or more. The M7279 can be used at a gain between (1) and (2) shown in the gain graph.



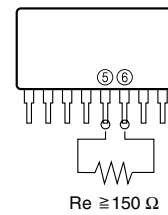
Variation of gain and frequency response



- (1) WITHOUT RESISTOR
- (2)  $150\ \Omega$  RESISTOR BETWEEN PINS #5 AND #6

\* The output offset voltage also changes when  $R_e$  is connected to the M7279. Adjust the offset voltage by referring to the offset voltage adjustment method explained above.

GAIN INCREASING



#### PC board layout

When designing the PC board layout for mounting the M7279, the input signal line (pin 1) must be kept as short as possible to avoid impairing the high-speed response.

Do not connect the supply voltage ( $\pm V_s$ ) to pins 1, 3, 4, 5 and 7.

Use a wide area for ground.

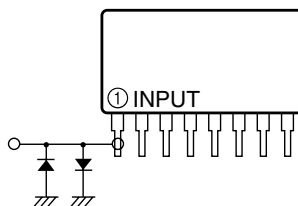
Connect external bypass capacitors between the power supply lines ( $\pm V_s$ ) and ground, and keep the wiring as short as possible.

The output impedance of the M7279 is  $50\ \Omega$ . Make sure the signal output line matches the  $50\ \Omega$  impedance.

When mounting the M7279 on a PC board, directly insert the pins into the terminal holes on the PC board without using any socket.

We recommend connecting diodes to pin 1 as shown below for over-current protection.

Don't connect any of option pins to anywhere in circuit unless using the option. Keep on disconnecting condition when not used.



TACCC0111EA

# AMPLIFIER MODULES M7279, M8879

## HOW TO USE

### ●M8879

#### To adjust the offset voltage:

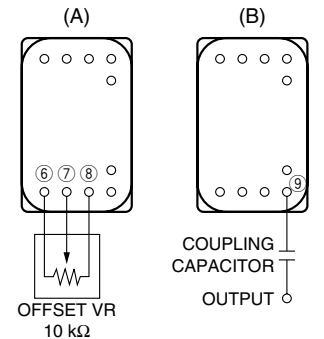
The DC offset voltage level varies with the ambient temperature and the internal impedance of the signal lines. To adjust this offset voltage level, externally connect a variable resistor across the option lead pins as shown in figure (A) on the right.

If a capacitor is connected to pin 9 as shown in figure (B) on the right, this acts as AC coupling and eliminates the offset voltage.

#### PC board layout

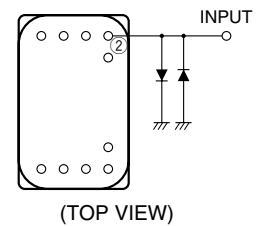
When designing a PC board layout for mounting the M8879, it is recommended to follow below suggestion in order to maintain its high-speed response.

- The pattern for input signal line and output signal line should not be longer than 7 mm and connection should be made with coaxial cable.  
(The characteristic impedance of coaxial cable should be 50  $\Omega$  and the length of core cable should be as short as possible.)  
Use a cable clamp or a cable crimp type connector to a coaxial (cable).
- All of pins from the M8879 should be connected on a PC Board.
- Do not connect the supply voltage ( $\pm V_s$ ) to the pins 2, 6, 7, 8 and 9.
- Use a wide area for ground.
- Connect external bypass capacitors between the power supply lines ( $\pm V_s$ ) and ground, and keep the wiring as short as possible.
- The output impedance of the M8879 is 50  $\Omega$ . Make sure the signal output line matches 50  $\Omega$  impedance.
- When mounting the M8879 on a PC board, directly insert the pins into the terminal holes on the PC board without using any socket. We recommend connecting diodes to pin 2 as shown on the right for over-current protection.
- Don't connect any of option pins to anywhere in circuit unless using the option. Keep on disconnecting condition when not used.



(TOP VIEW)

TACCC0118EA



(TOP VIEW)

TACCC0119EA

### CAUTION

If the supply voltage exceeds the maximum rating or is misconnected, the amplifier modules may be damaged or overheat.

# HAMAMATSU

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