

MCT (HgCdTe) Photoconductive Detectors (TE-cooled Types)

Thermoelectric cooling assures stable operation over extended time periods

● Choice of spectral response

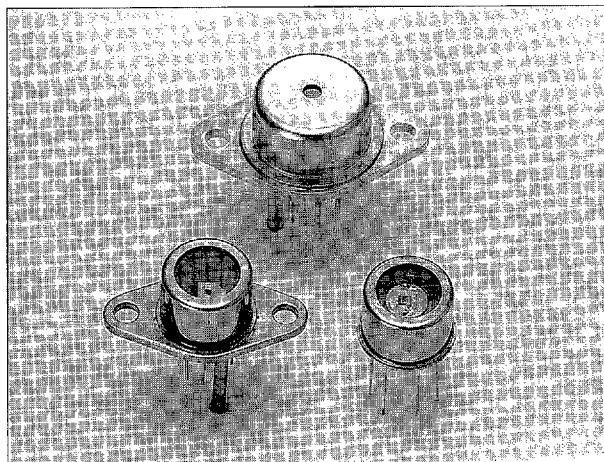
The band gap of HgCdTe can be modified by controlling the composition ratio of HgTe and CdTe. Utilizing this fact, various types are available in different spectral responses.

● Photoconductive mode operation

These devices operate in the photoconductive mode in which electrical resistance decreases with the input of infrared radiation.

● Custom devices available

In addition to standard items listed in this catalog, custom devices are available with different active areas and numbers of elements.



● SPECIFICATIONS (Common)

Window Material	Sapphire glass
Thermistor Allowable Dissipation	0.2 mW
Peltier Element Allowable Dissipation	1.0 A
Operating Temperature	-20 to +60 °C
Storage Temperature	-20 to +60 °C

● ACCESSORIES (Optional)

Heatsink for two-stage TE-cooled types : A3179-01
 Temperature controller for TE-cooled types : C1103-05
 Preamplifier for MCT detectors (TE-cooled) : C5185-01

(Typical data unless otherwise specified)

Type No.	Outline No. (P.34, 37)	Package	Active Area	Element Temperature	Peak Wavelength λ_p	Cutoff Wavelength λ_c	Photo Sensitivity S at λ_p	D^* (500, 1200, 1)		D^* (λ_p , 1200:1)	NEP at λ_p	Rise Time tr 0 to 63 %	Dark Resistance R_d	Maximum Allowable Current
								Min	Typ					
			(mm)	(°C)	(μ m)	(μ m)	(V/W)	($\text{cm} \cdot \text{Hz}^{1/2}/\text{W}$)	($\text{cm} \cdot \text{Hz}^{1/2}/\text{W}$)	($\text{cm} \cdot \text{Hz}^{1/2}/\text{W}$)	(W/Hz ^{1/2})	(μ s)	(Ω)	(mA)

Two-stage TE-cooled Types

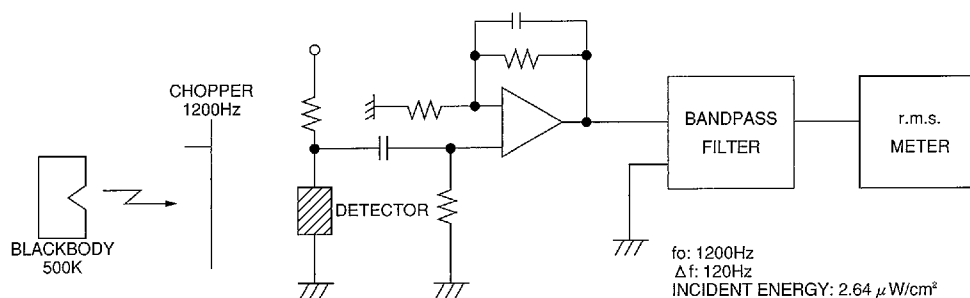
P3981	⑤	6-pin TO-8	1x1	-30	3.6	3.7	1×10^4	2×10^8	2×10^9	5×10^{10}	2×10^{-12}	10	600	2
P3981-01	②④	TO-66	1x1	-30	3.6	3.7	1×10^4	2×10^8	2×10^9	5×10^{10}	2×10^{-12}	10	600	2
P3982	⑤	6-pin TO-8	1x1	-30	2.9	3.1	4×10^4	1×10^8	1×10^9	1×10^{11}	1×10^{-12}	30	2000	0.5
P3982-01	②④	TO-66	1x1	-30	2.9	3.1	4×10^4	1×10^8	1×10^9	1×10^{11}	1×10^{-12}	30	2000	0.5

Three-stage TE-cooled Types

P2750	⑤	8-pin TO-3	1x1	-60	4.8	5	2×10^3	5×10^8	3×10^9	2×10^{10}	5×10^{-12}	5	200	3
P2750-04		8-pin TO-3	0.1x0.1	-60	4.8	5	2×10^4	5×10^8	3×10^9	2×10^{10}	5×10^{-13}	5	200	3

⑤ Photo sensitivity depends on the bias current. The value listed is measured with the optimum bias current.

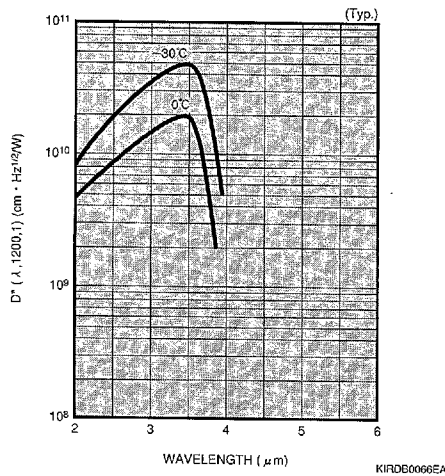
● Measuring Block Diagram



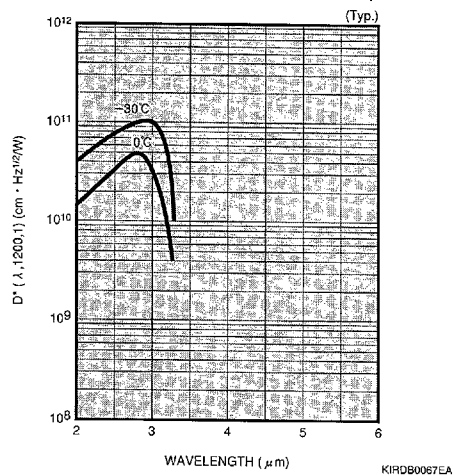
KIRD00005EA

Spectral Response 2 to 5 μm

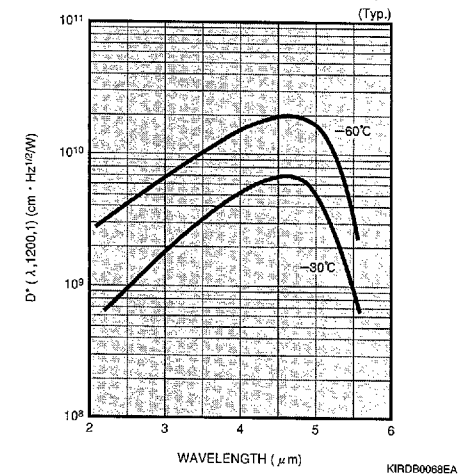
• Spectral Response (P3981 Series)



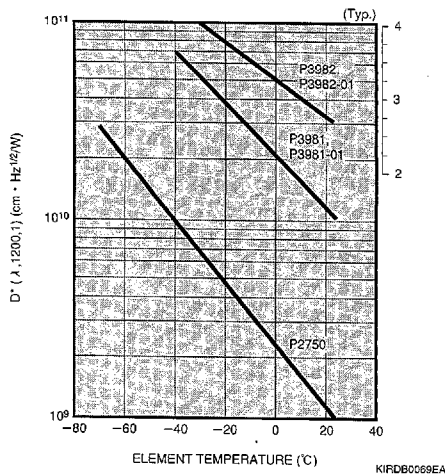
• Spectral Response (P3982 Series)



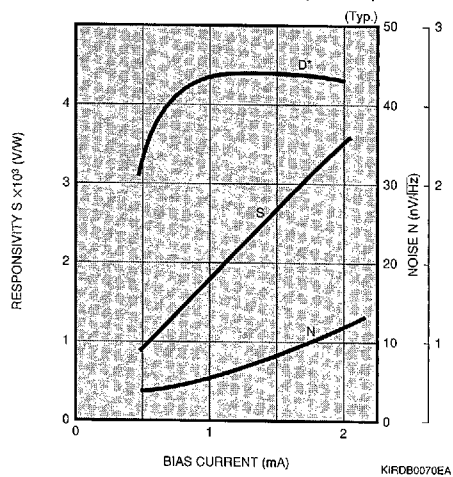
• Spectral Response (P2750 Series)



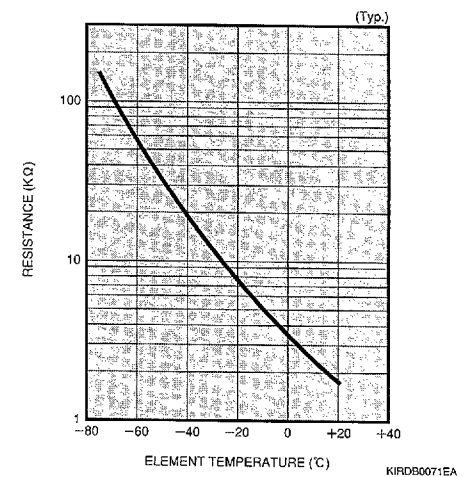
• D* vs. Element Temperature



• S/N Ratio vs. Bias Current (P2750)

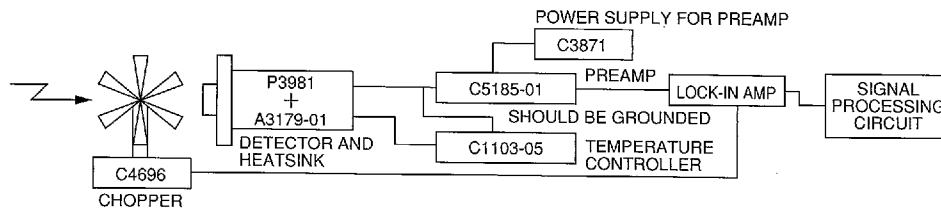


• Temperature Characteristic for Thermistor



The detector must be operated in a range where the S/N ratio becomes max.

• Connection Example



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Precautions for Use

1) Bias Current for MCT Photoconductive Detector

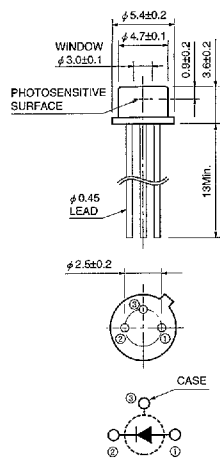
If the bias current is increased more than necessary, the element temperature rises due to Joule heat, resulting in degradation in the D^* . It should also be noted that if the bias current is applied in excess of the maximum supply current, even momentarily, then the element could be damaged. Therefore, use of a bias power supply with low ripple and careful choice of the optimum bias current is recommended.

2) Handling

Refer to "Precautions for Handling TE-cooled Detectors" on page 51.

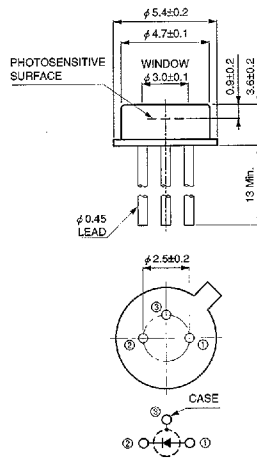
Dimensional Outlines (Unit: mm)

① G3476-01, etc.



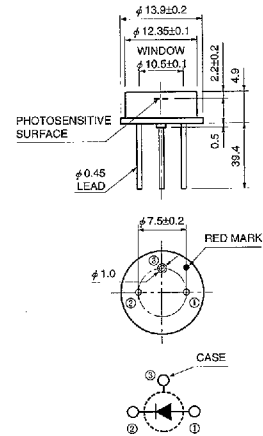
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② G5832-02, -03



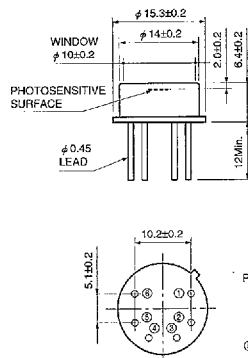
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③ G5832-05, etc.



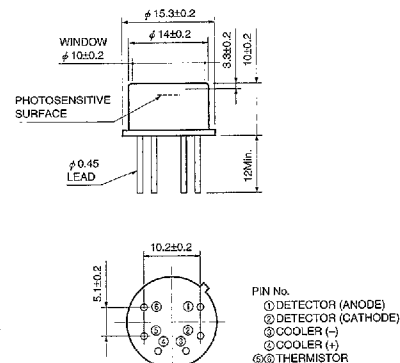
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④ G5832-11, etc.



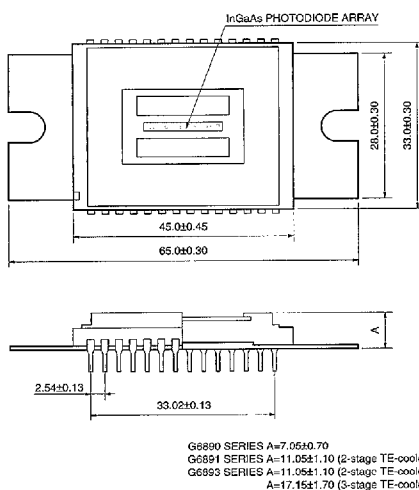
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⑤ G5832-21, etc.



KIRDA0003EB

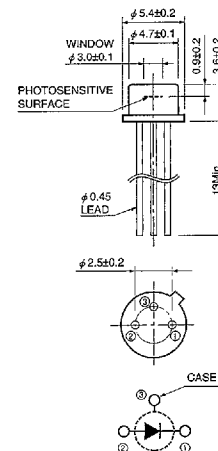
⑥ G6890-128, etc.



G6890 SERIES A=7.06±0.70
G6891 SERIES A=11.05±1.10 (2-stage TE-cooled)
G6892 SERIES A=11.05±1.10 (2-stage TE-cooled)
G6893 SERIES A=17.15±1.70 (3-stage TE-cooled)

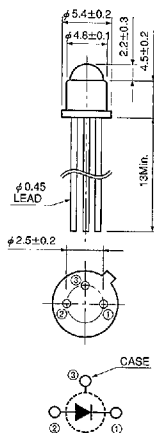
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⑦ B1720-02, etc.



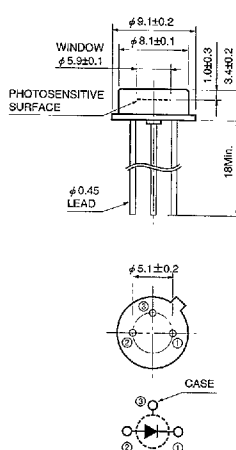
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8 B1720-05



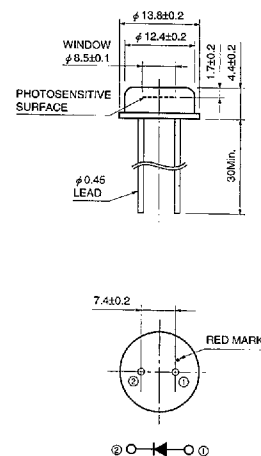
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9 B2144-01, etc.



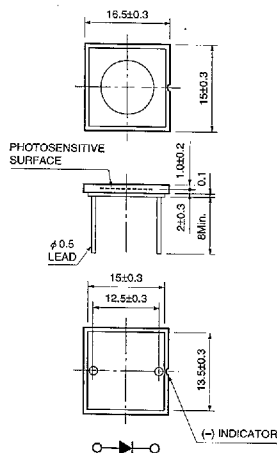
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10 B1919-01



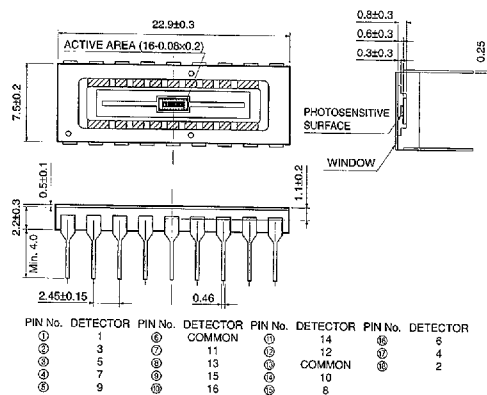
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11 B1920-01



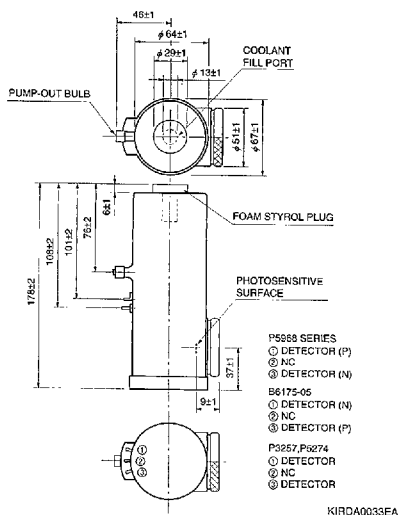
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12 G7151-16



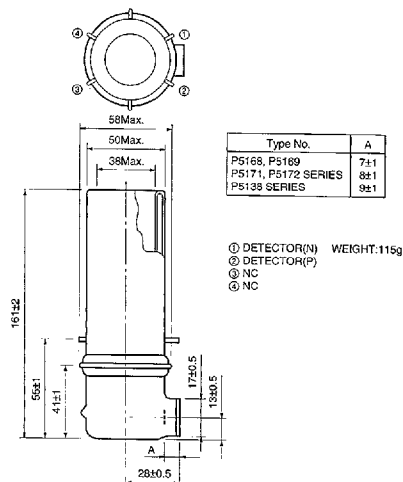
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13 P5968 series, P7163, B6175-05, etc.



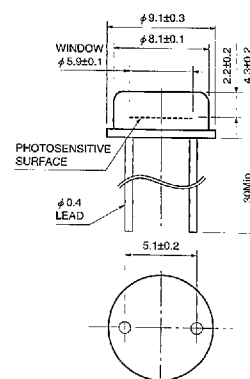
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14 P5138, etc.



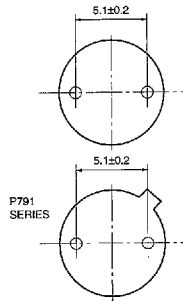
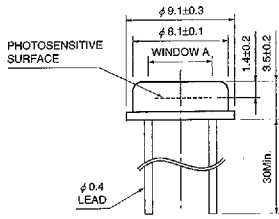
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15 P394



KIRDA0055EA

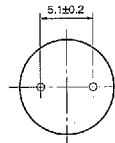
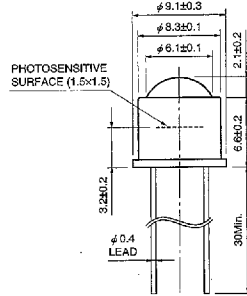
16 P394A, etc.



	P791 SERIES	OTHERS
A	5.5±0.1	5.9±0.1

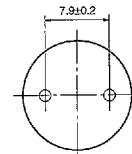
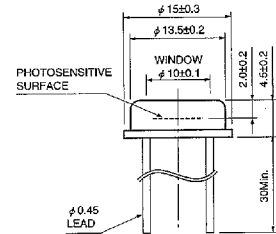
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17 P3226-02



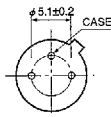
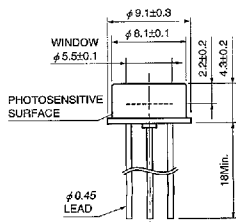
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18 P397



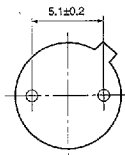
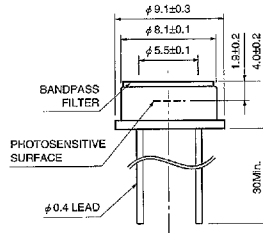
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19 P791-11



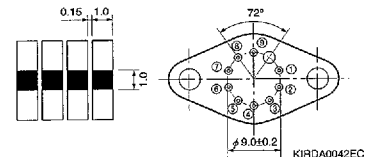
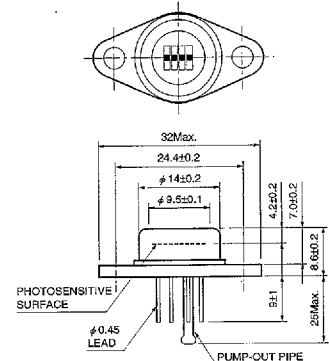
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20 P3207-04



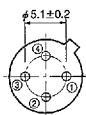
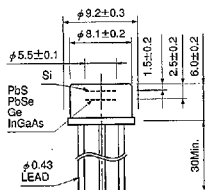
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21 P4115



KIRDA0042EC

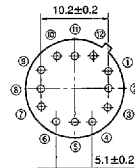
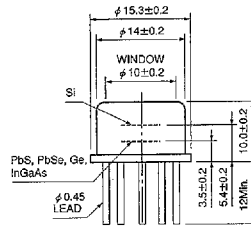
22 K1713-01, etc.



PIN No.
① Si (N)
② Si (P)
③ PbS, PbSe, Ge, InGaAs (N)
④ PbS, PbSe, Ge, InGaAs (P)

KIRDA0041EA

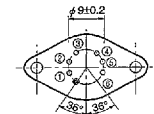
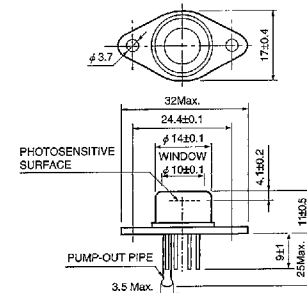
23 K3413-01, etc.



PIN No.
① PbS, PbSe, Ge, InGaAs (P)
② PbS, PbSe, Ge, InGaAs (N)
③ COOLER (-)
④ COOLER (+)
⑤ THERMISTOR
⑥ Si (N)
⑦ Si (P)

KIRDA0043EA

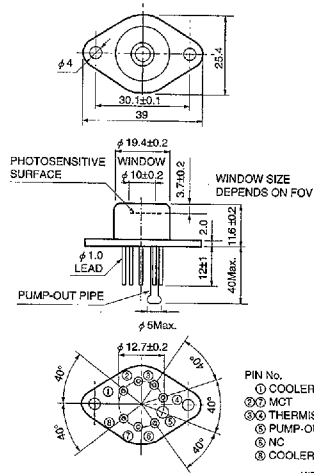
24 P3981-01, etc.



PIN No.
① THERMISTOR
② THERMISTOR
③ DETECTOR
④ DETECTOR
⑤ COOLER (-)
⑥ COOLER (+)

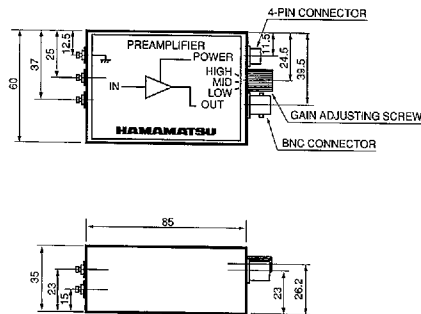
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25 P2750, etc.



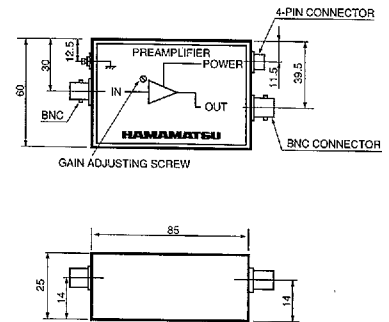
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26 C4159, -01, -03



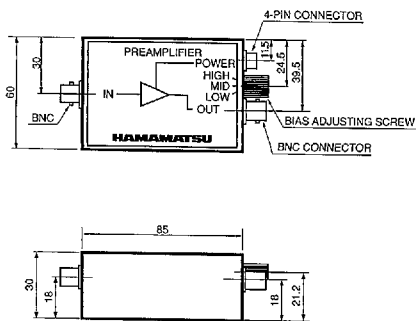
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27 C4159-02



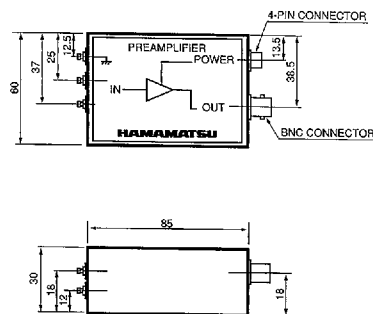
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28 C5185, -01



KIRDA0048EB

29 C3757-02



KIRDA0049EA