

InAs, InSb Photovoltaic Detectors

Photovoltaic detectors with high-speed response and low noise

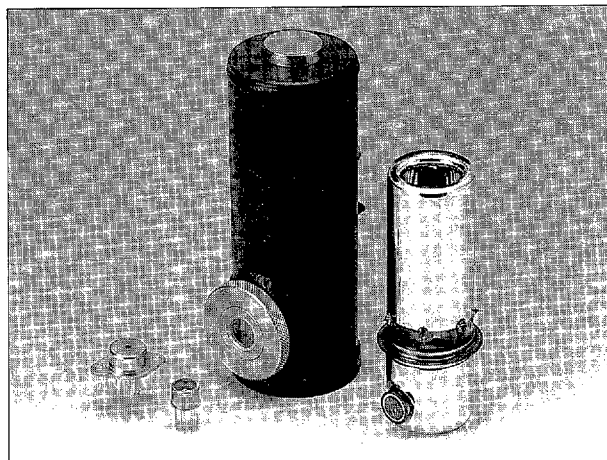
● Long cooling hold time: 8 hours

A large capacity glass dewar (cooled by liquid nitrogen) is used for standard detector package. It allows for 8-hour continuous cooling. Metal dewar types are also provided, which can be re-evacuated when necessary.

● Integral detector/preamplifier devices available

A glass dewar type detector and a preamplifier are integrated into a compact cylindrical case for facilitating high precision measurement. For more details, see page 27.

InAs detectors cover a wavelength range equivalent to that of PbS cells, and InSb detectors cover a range equivalent to PbSe cells. However, InAs and InSb detectors have higher response speed and lower noise than those of PbS and PbSe cells.



● SPECIFICATIONS (Common)

Window Material	Sapphire glass
Maximum Reverse Voltage	0.5 V
Operating Temperature	-20 to +60 °C
Storage Temperature	-20 to +60 °C

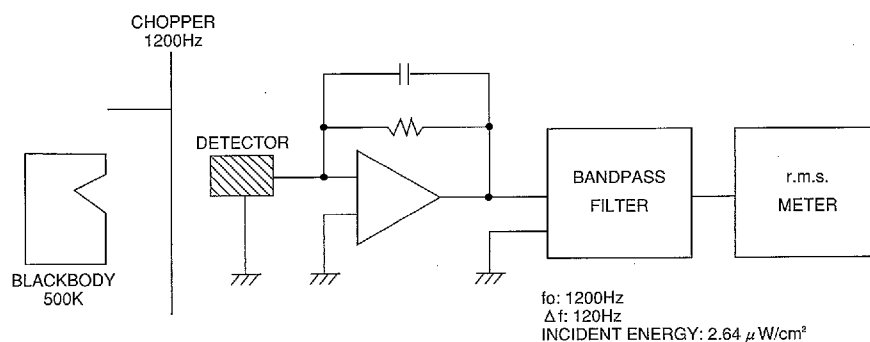
● ACCESSORIES (Optional)

Preamplifier for InSb detectors : C4159-01
Housing for glass dewar devices : A3262-02
Preamplifier for InAs may be available, please consult our sales office.

(Typical data unless otherwise specified)

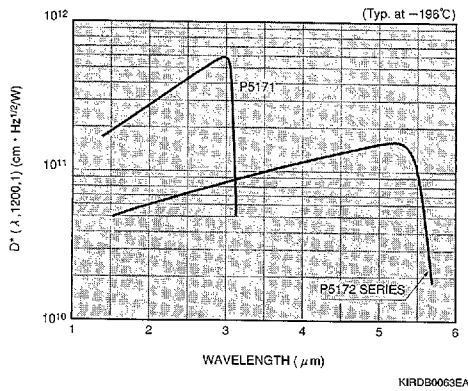
Type No.	Outline No. (P.35)	Active Area	Element Temperature	Peak Sensitivity Wave-length λ_p (μm)	Cut-off Wave-length λ_c (μm)	Photo Sensitivity $S_{at \lambda_p}$ (A/W)	Shunt Resistance R_{sh} (Ω)	D^* (500, 1200, f)		D^* (λ_p , 1200, f)	NEP at λ_p (W/Hz ^{1/2})	Rise Time t_r 0 to 63 % (μs)	Terminal Capacitance C_t (pF)
								Min.	Typ.				
Metal Dewar Type InAs Detector (FOV 60°)													
P7163	18	$\phi 1$	-196	3.0	3.1	1	1×10^5	6×10^9	1×10^{10}	6×10^{11}	2×10^{-13}	1	150
Glass Dewar Type InSb Detectors (FOV 60°)													
P5172-060	19	$\phi 0.6$	-196	5.3	5.5	2	1×10^7	2×10^{10}	3×10^{10}	1.5×10^{11}	4×10^{-13}	1	30
P5172-100		$\phi 1$					1×10^6				6×10^{-13}		70
P5172-200		$\phi 2$					1×10^5				1×10^{-12}		150
Metal Dewar Type InSb Detectors (FOV 60°)													
P5968-060	18	$\phi 0.6$	-196	5.3	5.5	2	1×10^7	2×10^{10}	3×10^{10}	1.5×10^{11}	4×10^{-13}	1	30
P5968-100		$\phi 1$					1×10^6				6×10^{-13}		70
P5968-200		$\phi 2$					1×10^5				1×10^{-12}		150

● Measuring Block Diagram



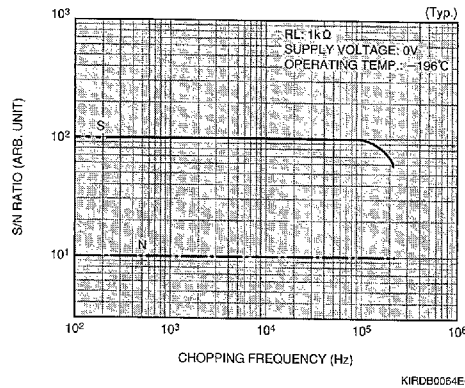
Spectral Response InAs : 1 to 3.1 μm InSb : 1 to 5.5 μm

● Spectral Response

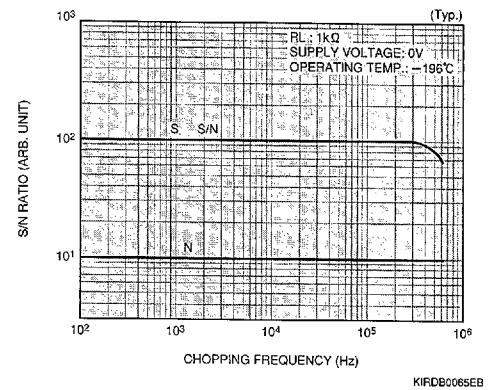


● S/N Ratio vs. Supply Voltage

A) InAs

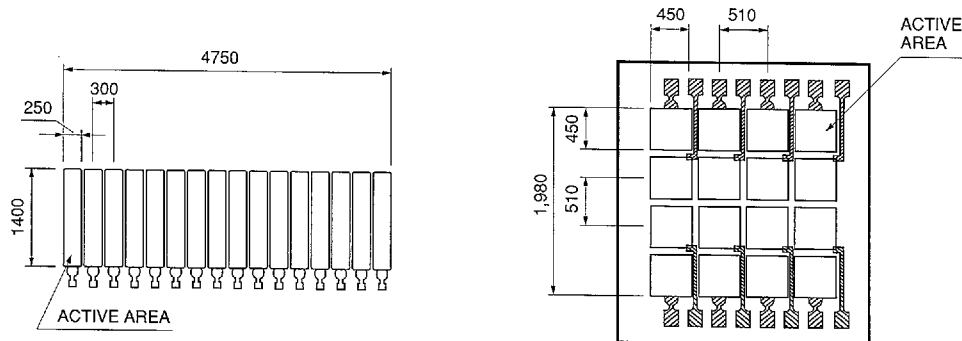


B) InSb



● Details of Multielement Detectors (Reference Examples; Unit: μm)

InSb detectors are also available in multielement arrays. For the number of elements, element size and packaging, please consult us with your specific needs.



Precautions for Use

1) Pouring Liquid Nitrogen

When visible or UV light other than infrared light to be measured enters an InSb detector, an electric charge may accumulate on the detector surface, causing an increase in the dark current. This increases the noise level, inviting degradation of the S/N ratio. When using an InSb detector, before pouring liquid nitrogen, put a cover (e.g. affix black tape double) on the input window so that visible light (room illumination) and UV light cannot fall on the detector. If the detector is exposed to visible light or UV light after the dewar has been filled with liquid nitrogen and the dark current is increased, remove the liquid nitrogen to raise the detector temperature back to room temperature. Then carry out the above procedure again. The dark current will decrease to the original value.

Also, before pouring liquid nitrogen into the dewar, be sure to check that no water or moisture remains inside the dewar, as it may cause cracks in the glass dewar when frozen.

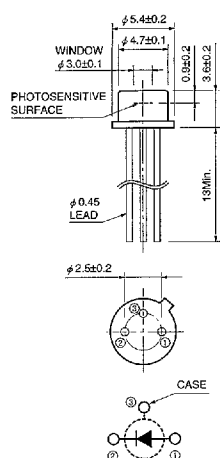
When filling the dewar with liquid nitrogen, use the following procedure: First pour 20 to 30 cc into the dewar and wait for a while until the whitish vapor (made by the ebullient liquid nitrogen) settles. Then pour another 20 to 30 cc into the dewar and wait for a while again. The remainder of filling may be done in one step. (Sudden filling from the beginning can cause the liquid nitrogen to overflow or splash.)

2) Handling

Refer to "Precautions for Handling Dewar Type Detectors" on page 51.

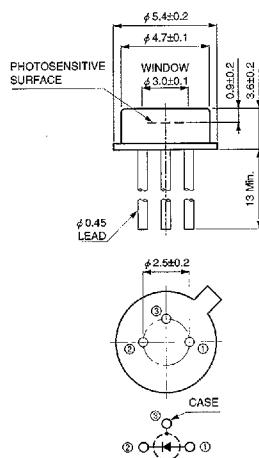
Dimensional Outlines (Unit: mm)

① G3476-01, etc.



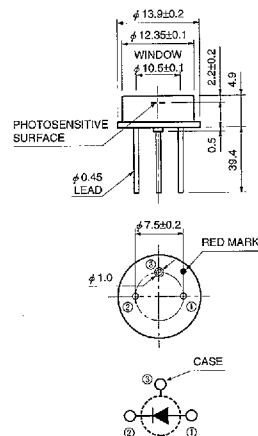
KIRDA0034EA

② G5832-02, -03



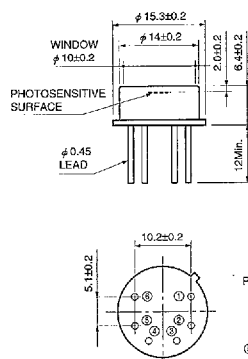
KIRDA0002EB

③ G5832-05, etc.



KIRDA0005EA

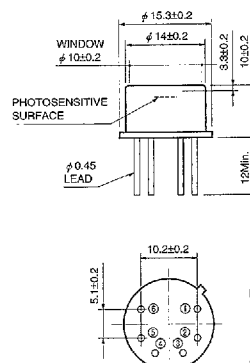
④ G5832-11, etc.



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

KIRDA0028EB

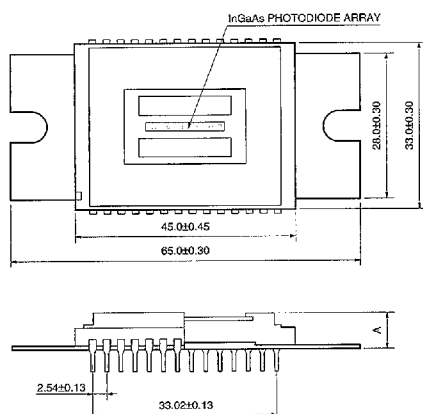
⑤ G5832-21, etc.



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

KIRDA0031EB

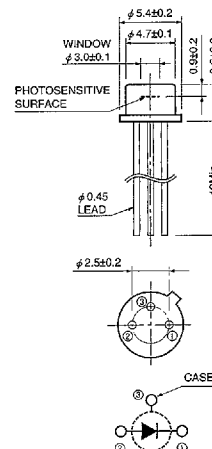
⑥ G6890-128, etc.



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

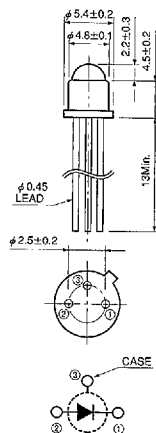
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⑦ B1720-02, etc.



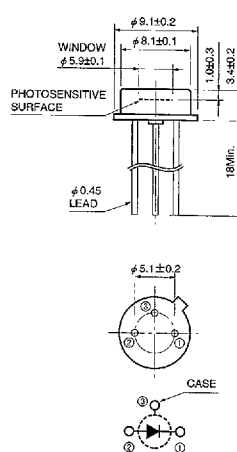
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8 B1720-05



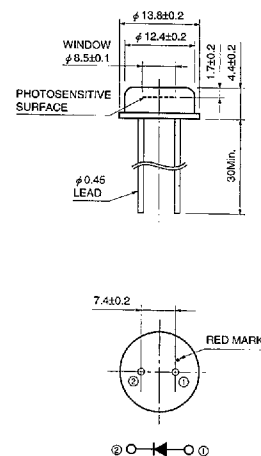
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9 B2144-01, etc.



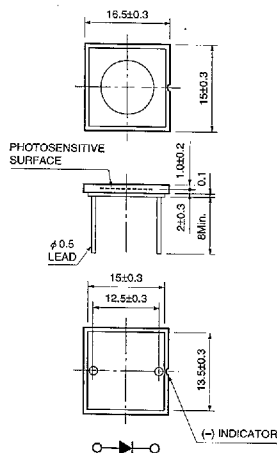
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10 B1919-01



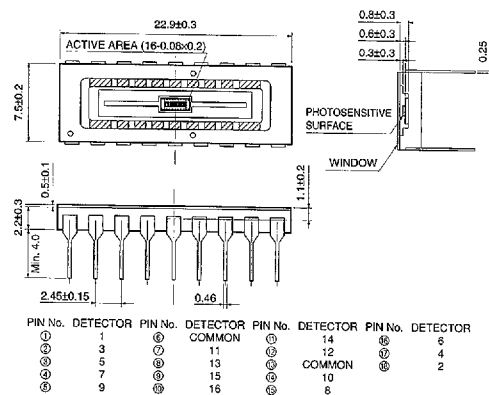
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11 B1920-01



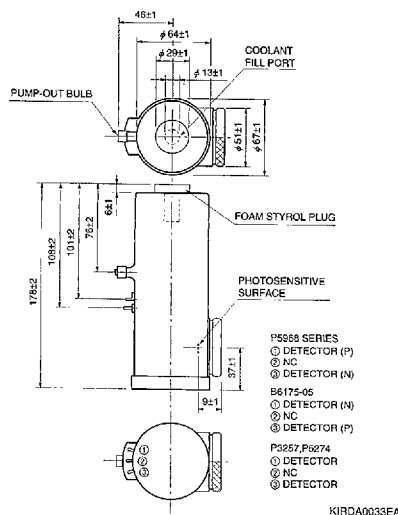
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12 G7151-16



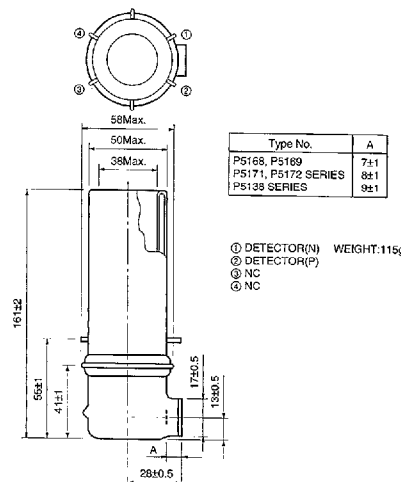
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13 P5968 series, P7163, B6175-05, etc.



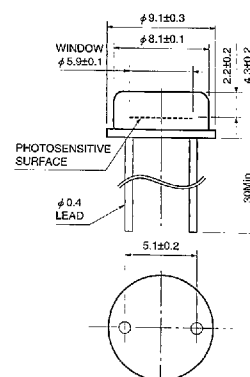
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14 P5138, etc.



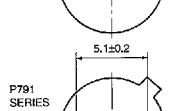
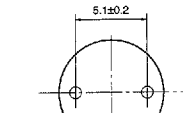
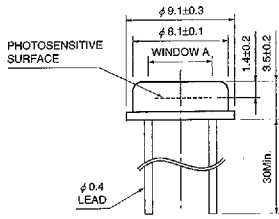
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15 P394



KIRDA0055EA

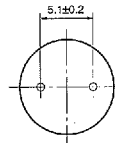
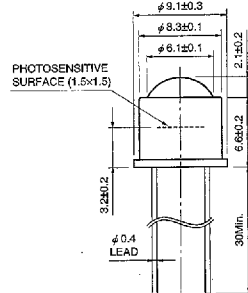
16 P394A, etc.



	P791 SERIES	OTHERS
A	5.5±0.1	5.9±0.1

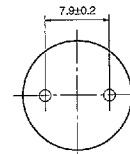
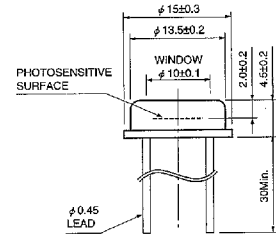
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17 P3226-02



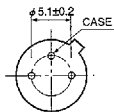
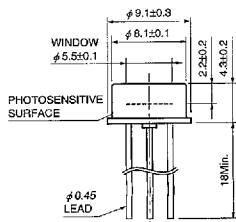
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18 P397



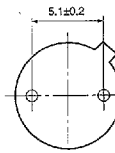
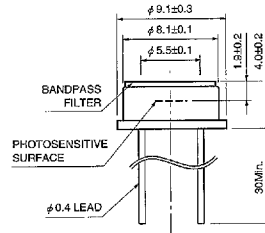
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19 P791-11



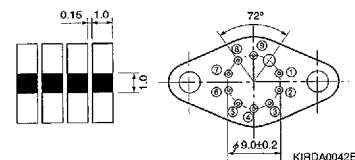
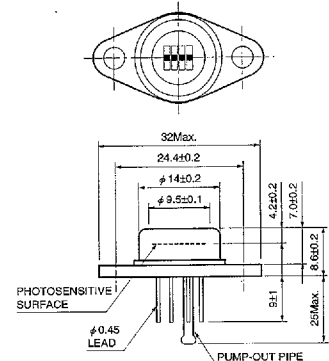
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20 P3207-04



KIRDA0054EA

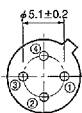
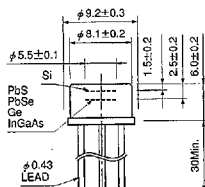
21 P4115



PIN No.
① THERMISTOR
② 1
③ 2
④ 3
⑤ 4
⑥ COMMON
⑦ COOLER (-)
⑧ COOLER (+)

KIRDA0042EC

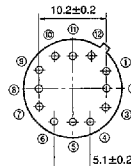
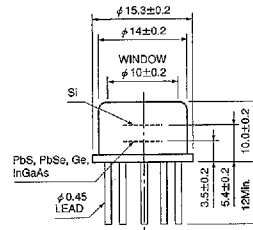
22 K1713-01, etc.



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

KIRDA0041EA

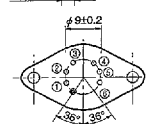
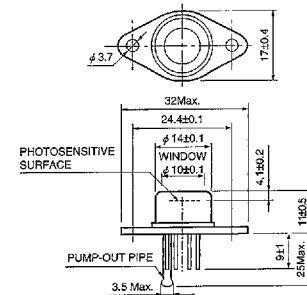
23 K3413-01, etc.



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

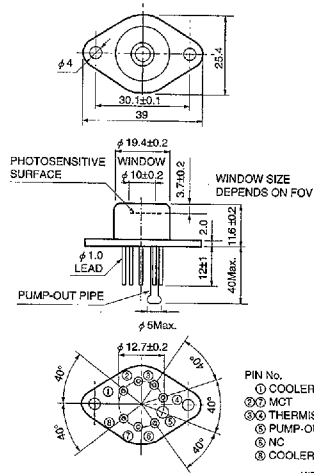
24 P3981-01, etc.



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

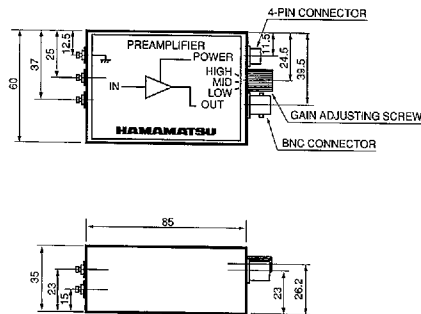
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25 P2750, etc.



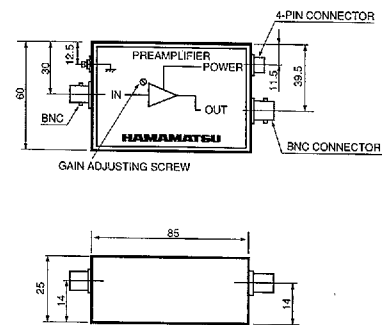
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26 C4159, -01, -03



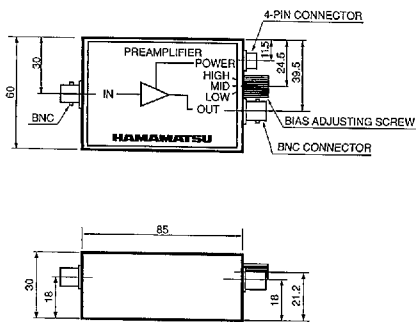
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27 C4159-02



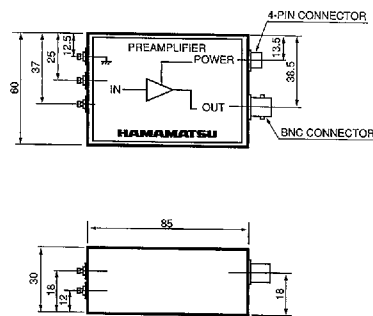
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28 C5185, -01



KIRDA0048EB

29 C3757-02



KIRDA0049EA