

PLASMON-POLARITON PHOTODETECTOR (PPP)

Areas of Application

The device is to be used for measuring light incidence angle, polarization or wavelength; for recording changes in the near-surface area of photodetector as a basis for design of highly sensitive detectors of plasmon-polariton type; in optical laboratories, medicine, biology, and environmental protection

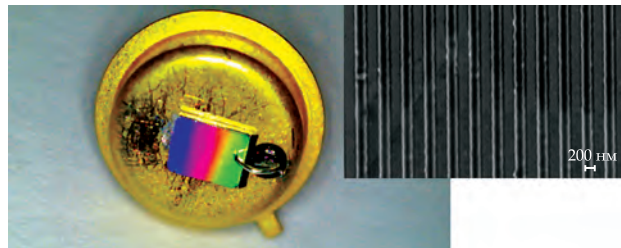
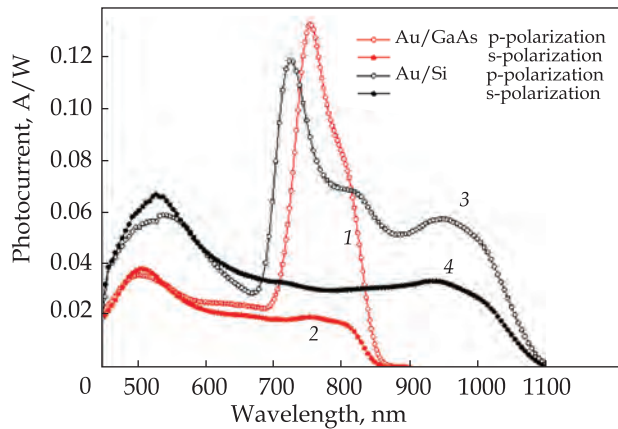


Photo and SEM image of the surface of Au/GaAs plasmon-polariton photodetector having a microrelief of diffraction grating with a period of 750 nm

Specification

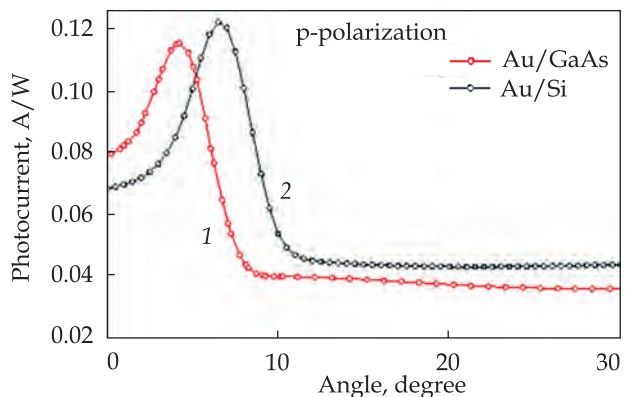
Parameters	Specification of devices based on	
	GaAs	Si
Plasmon-active metal	Au	
Operating wavelength λ , nm	600-830	600-1000
Maximum polarization sensitivity ($\lambda = 750$ nm), I_p/I_s	6:1	3:1
Angular half-width of resonance maximum, $\Delta\Theta$	4.5°	
Photosensitivity at resonance maximum, A/W	0.12	



Spectral characteristics of photocurrent of plasmon-polariton photodetectors based on Au/GaAs (1,2) and on Au/Si (3,4) for p-(1,3) and s-(2,4) polarized light

Advantages

There are no analogs in Ukraine. Unlike the world counterparts, it has a flat interface between gold and semiconductor, which enhances resonance twice, reduces surface recombination and dark currents. The PPP has a simpler design, good resonance properties, and smaller dimensions as compared with the prism systems for excitation and registration of surface plasmon resonance (SPR). One element is used for SPR excitation and its registration



Angle dependence of photocurrent of plasmon-polariton photodetectors based on Au/GaAs (1) and Au/Si (2) for p-polarized light

Stage of Development. Suggestions for Commercialization

IRL5, TRL4
Manufactured upon request

IPR Protection

IPR1, IPR3

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