(12) PATENT APPLICATION PUBLICATION
(19) INDIA
(22) Date of filing of Application :23/06/2020

(21) Application No.202011026533 A
(43) Publication Date : 31/12/2021

(54) Title of the invention : DEVICE FOR ENHANCING LIGHT ABSORPTION USING DOUBLE NANO-GRATINGS STRUCTURE

(51) International classification	:H01L0031035200, G01J0003020000, H01L0031023200, G02B0005180000, F28F0021080000
(31) Priority Document No	:NA
(32) Priority Date	:NA
(33) Name of priority country	:NA
(86) International Application No Filing Date	:NA :NA
(87) International Publication No	: NA
(61) Patent of Addition to Application Number Filing Date	:NA :NA
(62) Divisional to Application Number Filing Date	:NA :NA

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(57) Abstract :
The present disclosure relates to a photodetector (100) comprising: a first metal layer placed at a first end of the photodetector (100), the first metal layer receives incident light waves, wherein first metal layer is configured with a plurality of first grooves (102), each of the plurality of first grooves having a quadrangular cross section, and a second metal layer placed on a photonic semiconductor substrate (108), second metal layer configured with a plurality of second grooves (104),wherein a gap (106) is created between first metal layer and second metal layer, the gap adapted to allow incident light waves to pass through to the substrate, and wherein the incident light waves are coupled at each of the first grooves and corresponding second grooves to form coupled light waves such that the coupled light waves at the substrate have an absorption greater than the incident light waves.

No. of Pages : 16 No. of Claims : 7