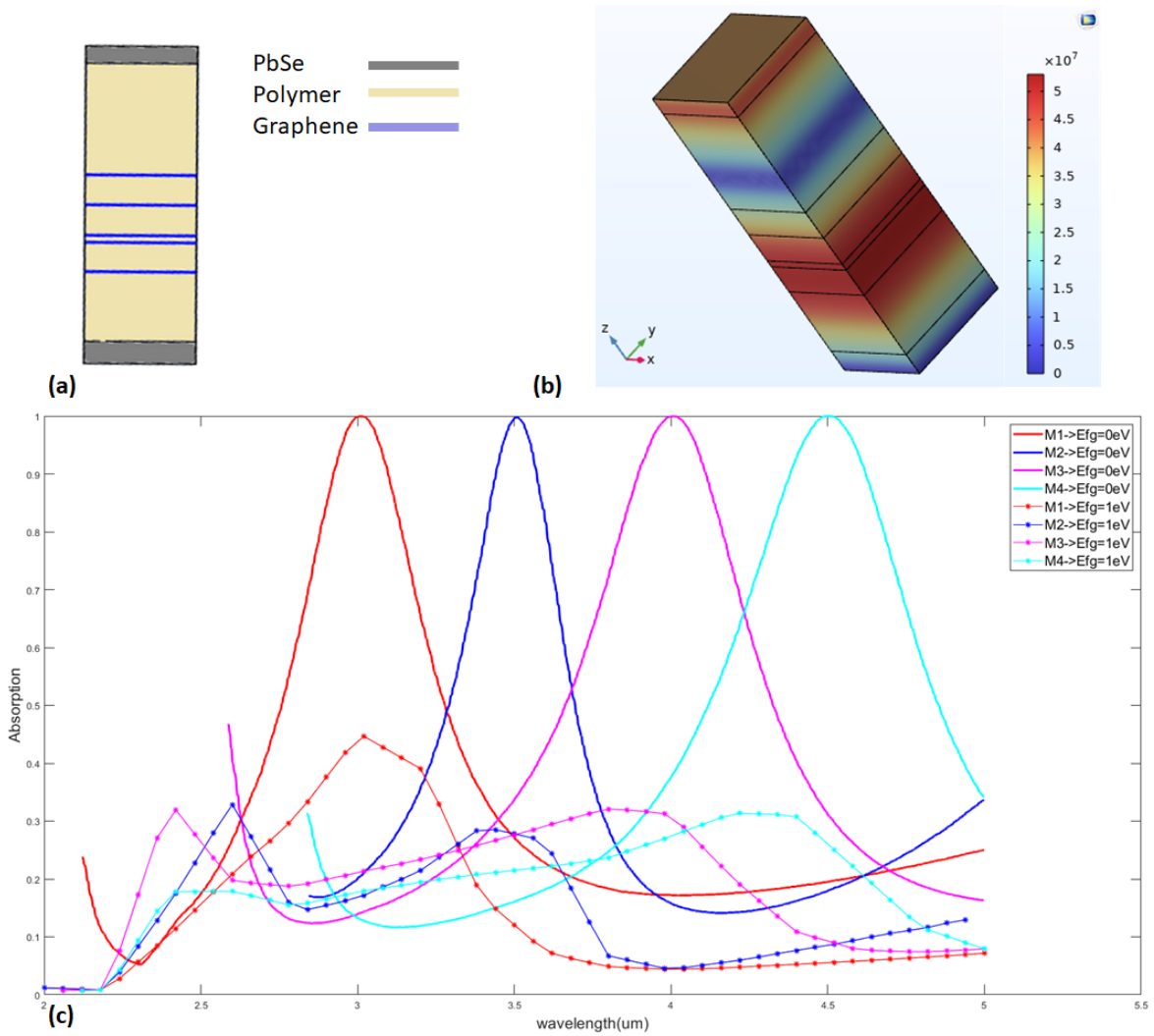

Figure 1(a) schematic of the proposed nanophotonic multilayer structure with emphasize of the material and thickness. (b) electromagnetic wave of the structure at wavelength 3 um and zero electric field at graphene layers. (c) shows the switchability of four different optimized structure with narrowband absorption at 3(um), 3.5 (um), 4 (um) and 4.5(um) at zero electric field and 1 (ev) electric field at graphene layers.

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Suplementary Pages

Table 1 shows the optimized thickness of nanophotonic multilayer structure in order to have narrowband absorption at 3(um), 3.5 (um), 4(um) and 4.5 (um).

Model Thickness (nm)	M1(λ=3um)	M2(λ=3.5um)	M3(λ=4um)	M4(λ=4.5um)
PbSe	40.48	52.38	76.43	87.5
Graphene	0.3	0.3	0.3	0.3
Polymer	335.4	608.59	500.28	501.97
Graphene	0.3	0.3	0.3	0.3
Polymer	171.97	145.14	134.021	60.76
Graphene	0.3	0.3	0.3	0.3
Polymer	56.17	134.26	136.68	307.36
Graphene	0.3	0.3	0.3	0.3
Polymer	56.65	249.23	31.51	113.71
Graphene	0.3	0.3	0.3	0.3
Polymer	153.36	46.023	131.12	63.67
Graphene	0.3	0.3	0.3	0.3
Polymer	89.53	288.74	311.47	384.96
PbSe	110.26	100	99.87	80.23