Response to Reviewer 1 Comments

Point 1: I suggest to increase the size of the figures, and in particular, of the labels of the axes, which at the moment are very difficult to read (moreover, at the moment the supplementary material is inaccessibile).

Response 1: The size of the image has been adjusted so that it can be read more conveniently.

Point 2: At page 6, the Authors report a strange behavior: increasing the light power the net photocurrent decreases. If I have understood well, the Authors justify this saying that increasing the light power, even though the number of generated electron-hole pairs increases, the net photocurrent decreases because of the increased transport scattering. In my opinion, this is an unwanted behavior and this should be explicited in the text.

Response 2: It's true that this behavior is unwanted for photodetector and this need to be adjusted by temperature control. Now these have been explicited in the article. Moreover,
Li, Qiuzi, Das Sarma, S."Finite temperature inelastic mean free path and quasiparticle lifetime in graphene" Phys. Rev. B 8, 87 (2013), DOI: 10.1103/PhysRevB.87.085406 has been cited.

Point 3: At page 2, among the advantages of graphene for the photodetector fabrication, it should be cited also the possibility to easily tune the carrier density in the graphene (I suggest to cite your reference [12], together with:

P. Marconcini, M. Macucci, "Approximate calculation of the potential profile in a graphene-based device," IET Circuits, Devices & Systems 9, 30 (2015), DOI: 10.1049/iet-cds.2014.0003).

Q. Cui, Y. Yang, J. Li, F. Teng, X. Wang, "Material and Device Architecture Engineering Toward High Performance Two-Dimensional (2D) Photodetectors," Crystals 7, 149 (2017), DOI: 10.3390/cryst7050149

Response 3: Thank you for your suggestion and these two articles have now been cited as reference [29] and [30].

Point 4: Page 2, line 82: I would move "we call" at the beginning of the sentence;

Response 4: "we call" has been moved

Point 5: Page 2, lines 56 and 82: change "grapheme" to "graphene"

Response 5: Spelling errors have been fixed.

Point 6: Page 3, lines 114 and 115 (but also page 5, lines 158, 168, 169): correct the position and size of the exponent;

Response 6: The position and size of the exponent have been corrected.

Point 7: Page 3, line 122: change "photodetector with" to "photodetector;"

Response 7: We have changed "photodetector with" to "photodetector;".

Point 8: Page 4, lines 135, 136, 148, 149: change "um" to "micron"

Response 8: We have changed "um" to "micron".

Point 9: Page 4, line 146: substitute the comma with a dot

Response 9: We have substituted the comma with a dot.

Point 10: Page 5, line 154: write better the sentence: for example substitute "calculated" with "characterized", complete the sentence for the (b) panel

Response 10: We have substituted "calculated" with "characterized" and the sentence for the (b) panel has been completed.

Point 11: Page 5, line 171: add a bracket

Response 11: We have added a bracket.

Point 12: Page 5, line 172: does "0.38" mean that most of the times in the selected points there is no layer?

Response 12: In general, when N calculated by the formula (1) is greater than 0 and less than 1, we consider the number of graphene layers to be a single layer. This can be supported by “Lee, Dong Su , et al. "Raman Spectra of Epitaxial Graphene on SiC and of Epitaxial Graphene Transferred to SiO2." Nano Letters 8.12(2008):4320-4325.”.

Point 13: Page 5, lines 180-181 (but also page 5, lines 201-202): remove the semicolon (and complete the bracket)

Response 13: We have removed the semicolons and completed the brackets in these two sentences.

Point 14: Page 6, line 194: change "It" to "it"

Response 14: We have changed "It" to "it".

Point 15: Page 6, line 199: change "larger" to "smaller" (is it right?)

Response 15: Experimental data shows that the photocurrent obtained under the 0.051 mW laser irradiation was larger than that obtained under the 0.075 mW laser irradiation. This does not match the previous trend and can be related to the heat capacity of graphene and Seebeck effect,which needs to be studied more deeply.

Point 16: Page 6, line 206: change "5(b)" to "5(c)"

Response 16: We corrected the picture number.

Point 17: Page 7, lines 231-234: improve the sentence (for example: "a) Photon currents of QSFG samples, obtained with and without illumination, the excited wavelength is 650nm. b) Photon currents of EG samples, obtained with and without illumination. c) Net photocurrents of QSFG sample, reported as a function of the bias voltage, for different values of the light power. d) Responsivity and external quantum efficiency of QSFG sample, reported for different values of light power.)

Response 17: We have improved the sentence according to your suggestion.

Point 18: Page 9, line 312: write better "SiO2" in the title of the reference

Response 18: We have corrected the title of the reference.