

Supplementary Information:

**Silicon based mid-IR super absorber using hyperbolic
metamaterial**

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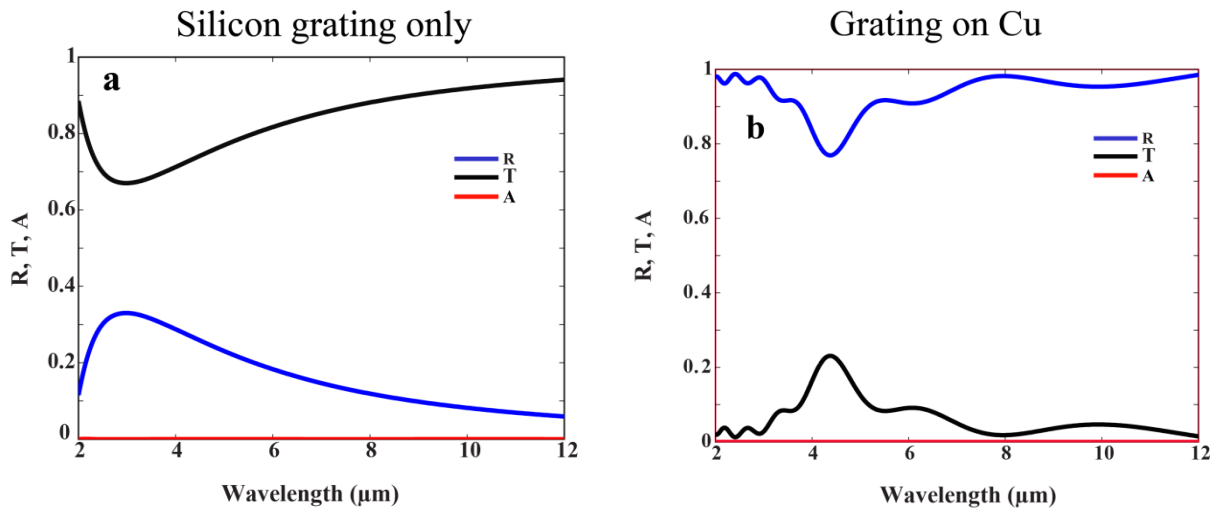


Figure S1: Reflection (R), Transmission (T) and absorption (A) spectrum. for a) Silicon hole grating only and b) Silicon grating on perfect reflector.

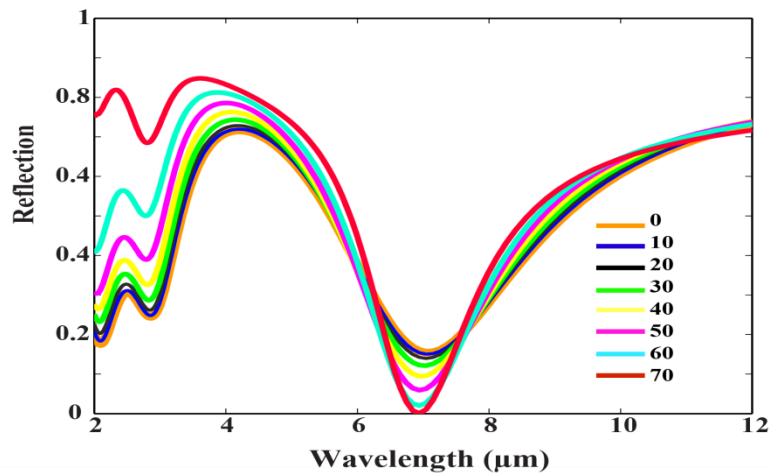


Figure S2. Reflection spectrum for uniform hole grating on HMM. Different angles of incidence from 0 to 70 degrees

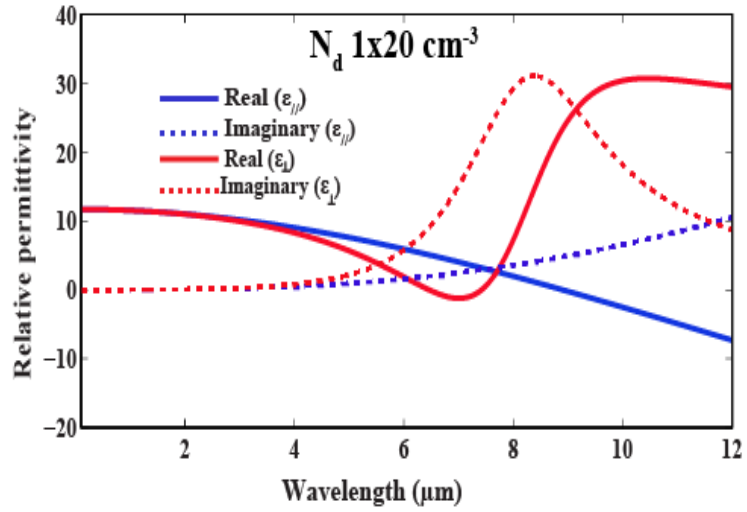


Figure S3. Dispersion relation for doped Si/Si HMM. N_d of $1 \times 10^{20} \text{ cm}^{-3}$.

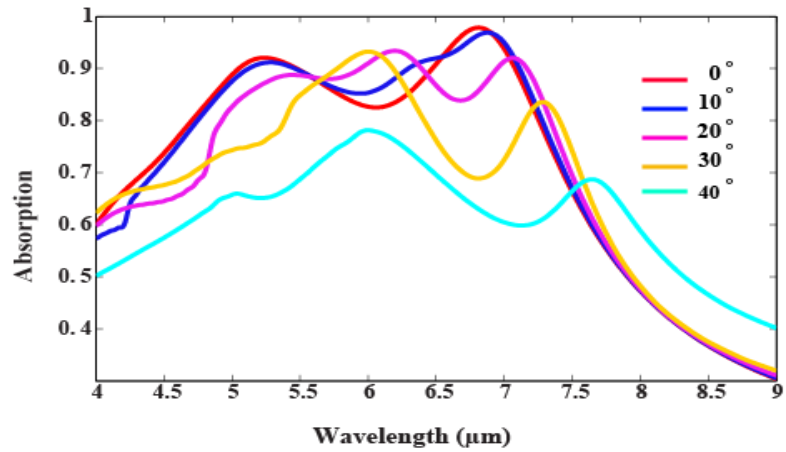


Figure S4. Broad band absorption for MHSG. Absorption for MHSG on N-doped Si/Si HMM at oblique incidence from 0 to 40 degrees.

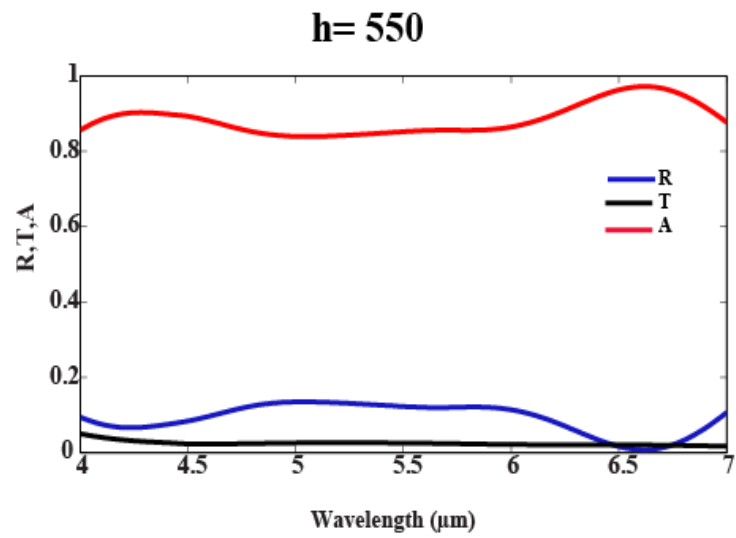


Figure S5. Broad band absorption for MDSG. R, T and A for MDSG on N-doped Si /Si HM at normal TM injection for grating of h 550 nm.