

Determination of Ti/Si interface charge density grown by plasma deposition

Sadeghzadeh, Mohamad Ali; Ghrib Shahi, Leyla; Abolhasani, Elham

Physics Department, Yazd University, Yazd

Abstract

In this paper a Ti/Si metal-semiconductor junction as the gate, was formed by plasma deposition on the clean Si surface of p-Si/SiGe/Si inverted modulation doped structures. There is a two dimensional hole gas (2DHG) in the alloy layer of this structure and its areal sheet density n_s can be controlled by application a voltage to the gate. The Ti/Si interface charge density has been determined by theoretical simulation of experimental results of $n_s - V_g$. The results indicates that as the Si cap thickness increases from 180 up to 480nm, the Ti/Si interface charge density varies from 4.6 down to 1.95×10^{15} cm² respectively.

PACS No. 81.15 Ef



www.SID.ir













(

)







www.SID.ir



: Ti V_g

www.SID.ir



x 10¹⁵

nin ter (m⁻²)

2.5

1.5 -1.5

 $n_{int}(0) l_c$

Ti/Si n _{int} (0)	l _c (nm) ()	
$/ \times (m^{-2})$		А
$/ \times (m^{-2})$		В
$/ \times (m^{-2})$		С
$/ \times (m^{-2})$		D

- [] Sadeghzadeh, M. A., et al. Appl. Phys. Lett. 74 (1999) 579-81.
- [] Sadeghzadeh, M.A., Appl. Phys.Lett. 76 (2000) 348-50.
- [] Emeleus, C. J., et al. J. Appl. Phys. 73 (1993) 3852.
- [] Getin, H., et al. Physica B: Condenced Matter 346 (2005) . 133-41.

" p-Si/SiGe/Si

.

Si

[]





www.SID.ir

0