

LIST OF ABBREVIATIONS

Abbreviation	Details
NM	Nanomaterials
0D	Zero dimensional
1D	One Dimensional
2D	Two Dimensional
3D	Three Dimensional
QDs	Quantam dots
DOS	Density of States
VLS	Vapour Liquid Solid
CMOS	Complementary Metal Oxide Semiconductor
TF	Thin Film
IC	Integrated Circuit
UV	Ultraviolet
SiNW	Silicon Nanowire
EBE	Electron Beam Evaporation
SG	Sol-gel
TTIP	Tetraisopropoxide [Ti(OC ₃ H ₇) ₄]
TEM	Transmission Electron Microscopy
AFM	Atomic Force Microscopy
SPM	Scanning Probe Microscopy
SEM	Scanning Electron Microscopy
EDS	Energy Dispersive X-ray Spectroscopy
XRD	X-Ray Diffraction
BHI	Barrier Height Inhomogeneity
TM	Thermionic Emission
MOCVD	Metal-Organic Chemical Vapour Deposition

ALD	Atomic Layer Deposition
PLD	Pulsed Laser Deposition
CBD	Chemical Bath Deposition
CVD	Chemical Vapour Deposition
GLAD	Glancing Angle Thin Film Deposition
EQE	External Quantum Efficiency
MSM	Metal-Semiconductor-Metal
NWs	Nanowires
SCLC	Space Charge Limited Current
EMDE	Electroless Metal Deposition and Etching
DRIE	Direct Reactive Ion Etching
SAED	Selected Area Electron Diffraction
COD	Crystallography Open Database
RTA	Rapid Thermal Annealing
GOF	Goodness of Fit
UV-Vis	Ultraviolet–Visible
MACE	Metal Assisted Chemical Etching
TCE	Trichloroethylene
DI	Deionized
PVA	Polyvinyl Alcohol
PVDF	Polyvinylidene Fluoride or Polyvinylidene Difluoride
PL	Photoluminescence
FTIR	Fourier-transform infrared spectroscopy
NR	Nanorod
FWHM	Full Width at Half Maximum
<i>I-V</i>	Current-Voltage
<i>C-V</i>	Capacitance-Voltage
<i>J - V</i>	Current density -Voltage

LIST OF SYMBOLS

Symbols	Details
n	n-type semiconductor
p	p-type semiconductor
e^-	Electron
A^*	Richardson's constant
m^*	Effective mass of electron
m_0	Rest mass of electron
k	Boltzmann constant
θ	Bragg angle
β	Full Width at Half Maximum (FWHM)
h	Plank's constant
q	Elementary or Electronic charge
J	Current density
T	Temperature
V_{d0}	Diffusion voltage
E_F	Fermi level
E_C	Conduction Band
E_V	Valence Band
E_g	Energy Band Gap
χ	Electron Affinity
$q\phi_B$	Schottky Barrier Height
ϕ_M	Metal Work Function
χ_S	Electron affinity of semiconductor
I_0	Reverse saturation current
η	Ideality factor

A	Area
$\phi_{B,eff}$	Effective barrier height
I_{Ph}	Photocurrent
I_d	Dark current
t_r	Rise time
t_f	Fall time
rpm	Revolutions per minute
$h\nu$	Photon energy
$\alpha(\lambda)$	Absorption coefficient
$Abs(\lambda)$	Absorbance
ρ	Electrical Resistivity
R_{sh}	Sheet resistance
N_D	Donor concentration
B	Magnetic field
V_H	Hall voltage
σ	Conductivity
μ	Mobility
C	Capacitance
V_{bi}	Built in potential
ϵ_s	Dielectric constant
$\phi_{B,eff}^{C-V}$	Barrier height via C-V
I_F	Forward bias current
I_R	Reverse bias current
R_{UV}	Responsivity
D	Bias dependent specific detectivity
RA	Resistance-area products
P_{opt}	Incident optical power

g	Photoconductive gain
$\lambda(nm)$	Wavelength in nm
R_0A	Zero-bias resistance-area product
ΔE_C	Conduction band offset
ΔE_V	Valence band offset
$^{\circ}C$	Unit of temperature in Celsius
K	Unit of temperature in Kelvin
$\eta(T)$	Temperature-dependent ideality factor
$I_0(T)$	Temperature-dependent reverse-saturation current
σ_0	Standard deviation
$P(\phi_B)$	Probability density function
ρ_1 and ρ_2	Temperature-dependent voltage deformation coefficients of the barrier height distribution
$\phi_{B,m}$ (V) and $\sigma(V)$	Bias-dependent mean barrier height and standard deviation, respectively
A^{**}	Modified Richardson constant
R	Reflectance
V	Voltage
I	Current