UNIVERSIDAD TECNICA FEDERICO SANTA MARIA

Memoria de Título

Nombre de la memoria de titulación

Tesis para optar al título de
Ingeniero Civil Electrónico

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Octubre 2024, Valparaíso, Chile

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Agradecimientos

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[1], [2], [3], [4], [5], [6], [7], [8], [9], [10], [11], [12], [13], [14], [15], [16], [17], [18], [19], [20], [21], [22], [23],

Capítulo 2

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Apéndice A

Sample Code for Appendix

This appendix provides an example of code used in the project. The code is displayed using the `verbatim` environment to preserve formatting and indentation.

A.1. Example Code: Bandgap Calculation in Python

```python
# Python code to calculate the bandgap of a semiconductor
def calculate_bandgap(Ec, Ev):
    """
    Function to calculate the bandgap energy.
    Ec: Conduction band energy (in eV)
    Ev: Valence band energy (in eV)
    Returns: Bandgap energy (in eV)
    """
    bandgap = Ec - Ev
    return bandgap


# Example usage
Ec = 3.4  # Conduction band energy for GaN (eV)
Ev = 0.0  # Valence band energy (reference, eV)

bandgap = calculate_bandgap(Ec, Ev)
print(f"The bandgap energy is {bandgap} eV.")
```

Apéndice B

Supplementary Tables

This appendix contains supplementary tables that provide additional data and detailed information used in this study.

B.1. Material Properties of GaN and Related Semiconductors

Tabla B.1: Material Properties of GaN and Related Semiconductors.

Property	GaN	SiC	Si
Bandgap Energy (eV)	3.4	3.3	1.1
Thermal Conductivity (W/m·K)	130	490	150
Breakdown Electric Field (MV/cm)	3.3	2.8	0.3
Electron Mobility (cm^2/V·s)	1200	900	1400
Lattice Constant (Å)	3.189	4.358	5.431

B.2. Experimental Parameters for Epitaxial Growth

Tabla B.2: Experimental Parameters for MOCVD Growth of GaN.

Parameter	Value	Unit
Growth Temperature	1050	°C
Reactor Pressure	200	mbar
Precursor Flow Rate (TMA/Ga)	50	sccm
NH_3 Flow Rate	5000	sccm
Growth Rate	2.5	μm/hr
Buffer Layer Thickness	25	nm

Tabla B.3: Performance Metrics of Fabricated GaN HEMTs.

Metric	Measured Value	Unit	Device ID
Threshold Voltage (V_{th})	-2.5	V	D1
Maximum Current Density	800	mA/mm	D1
Peak Transconductance (g_m)	200	mS/mm	D1
Breakdown Voltage	1200	V	D1

B.3. Device Performance Metrics

B.4. Comparison of Simulation and Experimental Results

Tabla B.4: Comparison of Simulation and Experimental Results.

Parameter	Simulation	Experiment
Electron Mobility (cm^2/V·s)	1350	1200
2DEG Density (cm^{-2})	$1{,}5 \times 10^{13}$	$1{,}2 \times 10^{13}$
Threshold Voltage (V_{th})	-2.2	-2.5
Breakdown Voltage (V)	1300	1200

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